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Five Empirical Essays on Corporate Taxation

Inauguraldissertation zur Erlangung des akademischen
Grades eines Doktors der Wirtschaftswissenschaften
der Universität Mannheim

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27. November 2012

Acknowledgements

In the production of the essays this doctoral series is comprised of, I have received extensive direct and indirect support from several people. Three of my five essays are co-authored and none of them would have made it to its current shape without the excellent working environment I was fortunate to work in. This is the place to thank some of the people who contributed to this work environment and I do so wholeheartedly.

My first and biggest thanks go to my academic supervisor, Professor Dr. Ulrich Schreiber. He showed me how taxes can be explained clearly and he constantly motivated me to bring out the best in my work. I had already had these experiences as a student of business administration at the University of Mannheim and they were reinforced once I became one of his doctoral students. Professor Schreiber truly believed in me and he granted me the academic freedom it took to fully realize my potential. His trust and his academic far-sightedness made me start working empirically. To me, Professor Schreiber was a mentor rather than a boss. He is a liberal in the best sense, leading by example and showing the greatest respect for his assistants. Words cannot express the debt of gratitude I owe him.

I am very grateful to Professor Dr. Johannes Voget for serving as the second referee of my doctoral thesis. He is an academic idol with impressive smartness and empirical capabilities. His attention is a very special honor to my work. I also express my deepest thanks to Professor Dr. Christoph Spengel. Being a member of the ZEW team, I had the pleasure of working for and with Christoph Spengel in several tax-related political consulting projects, mainly for the European Commission and for BAK Basel Economics. Professor Spengel's energy and work ethics are impressive, and the way he manages his tax team deserves the utmost respect. I am grateful that Christoph Spengel gave me the opportunity to actively participate in these projects.

I am grateful and indebted to my co-authors. First of all, I want to thank Professor Dr. Michael Overesch, who took me by the hand when my empirical knowledge was still minimal. I am thankful for him teaching me so much. Second, my thanks go to Carolin Holzmann. I had the pleasure of working with Carolin on extensive research projects beyond the essays covered in this thesis. She and her academic supervisor Professor Dr. Thieß Buettner form a congenial research team I was lucky to work with. I also thank my colleague and co-author Uwe Scheuering. Writing the joint paper with Uwe was one of my greatest research experiences.

Both at the ZEW and also among the University of Mannheim's tax colleagues I always felt at home. My department head at ZEW, PD Dr. Friedrich Heinemann, always wanted the best for me and made it become a reality. He, as well as the ZEW directorate, enabled me a sabbatical in preparation for the German tax consultant's degree and supported my research stay at Berkeley. I am very grateful for both of those events. Concerning my empirical research, I am grateful to the German Federal Bank's research center which provided me the access to the MiDi database, serving as the basis to four of my five papers.

It was an honor and a pleasure to work with some of the best colleagues I can imagine. Teaming up with colleagues such as Katharina Finke, Jost Heckemeyer, Uwe Scheuering, and Benedikt Zinn was a fantastic experience and I am happy and thankful to keep this memory in my heart.

I also express my thanks to the student research assistants Katrin Hohler, Fabian Poennighaus, Henrik Schoch, Lara Verdugo, Elisabeth Vogl and Benjamin Wannenwetsch who supported my academic and advisory work in an excellent manner.

Finally I would like to thank my family for setting me on the right track from the very beginning and for teaching me the values required for successfully staying on it while moving forward.

Mannheim, December 2012

Daniel Dreßler

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1. General Introduction

This doctoral thesis presents five empirical essays on the impact of corporate taxes on companies' decisions. Insights into empirical evidence are very valuable contributions to the scientific literature. They test to what extent the wide analytical models and assumptions on tax effects as well as anecdotal evidence correspond to reality in a general sense.

Empirical tax research is not *l'art pour l'art*. Apart from science itself, sound empirical evidence on tax effects is interesting and relevant to corporations and to policy makers. Corporations gain information on how the market, i.e. their competitors, react to taxes and can easily compare this behavior to their own reactions. Policymakers see the real effects of their tax instruments, allowing them to draw conclusions on imposed excess burdens, evasive actions and tax revenue implications.

All five papers are based on detailed and comprehensive micro datasets. The conclusions which are drawn from each of the five papers can therefore be considered as fairly representative. The observations used for identification stem from thousands of corporations which are traced over several years. Thanks to the inclusion of firm-fixed effects, such panels provide a sound image of tax effects on the average firm. Empirical research as applied in this thesis is not about tracing the sophisticated tax planning strategies of a single company, but about the reactions of the entire market or at least of clearly defined subgroups.

Empirics and analytics are not counterparts, but complements. Without an empirical validation, even the nicest analytical model has to cope with latent doubts on its right to exist. Empirics without an analytical basis are equally miserable. Just looking freehandedly at what the data tell the reader does not comply with scientific requirements. As can be seen in all five papers of this thesis, analytics and empirics need to build on each other and cross-fertilize. The hypotheses to be tested are to be based on analytical considerations. The insights from empirically testing them, however, may enlighten additional analytical aspects which remained hidden at first sight. Such aspects do not lead to a revision of the general analytical expectations, but in turn add up to them. There is no valuable empirical research without a sound analytical basis.

The five essays of this doctoral thesis cover the tax impact of three of the most important decisions of corporations: the decision of how much to invest, the decision of how to finance such investments, and the decision of what group structures to embed the investments in. Given that I fully concentrate on corporations, the only big tax question which is not regarded here is the choice of the organizational form. The three aspects of investment, financing and structuring are discussed one by one. The first three essays deal with the impact of taxes on investment, the fourth essay focuses on financing, and the fifth essay provides empirical evidence of tax-induced group structuring.

The very first essay, bearing the general title *The Impact of Corporate Taxes on Investment*, provides a comprehensive access and introduction to this thesis. Regarding both the contents and the methodological approach, this essay is more explanatory and more illustrative than the four that follow. Serving as a starting point and setting the basis, this first paper does not focus on the tax effect on investment alone, but also provides an outlook into the other two topic areas to be covered in this thesis. This first paper is the reason for my keeping the introduction compact. In doing so, I avoid redundancies.

All five papers deal with corporate taxes. Three of them solely focus on the impact of profit taxes on corporations' decisions, while two of them, *The Impact of Tax Treaties and Repatriation Taxes on FDI Revisited* and *Form Follows Function*, also take source taxes into account. Each of the five papers contains descriptive statistics and, in each of them, the tax hypotheses are derived in detail.

I have no intention of maximizing the size of this doctoral thesis. What I am eager to achieve is maximum clarity and maximum value to the scientific reader. Therefore, in one respect, I am not innovative: I refrain from enlarging or profoundly adjusting the essays as compared to the versions in which they were or are submitted to scientific journals. All of them had earlier versions which were considerably bigger. I am convinced, however, that the papers are in their best shape as they are right now. The structure of each paper, along with the abstract, is meticulously designed to enable the reader the best conceivable insight into a research topic. This equally refers to the respective paper's appendices and its list of references. Thus, as can be seen from the table of contents, I decided to keep present each of the essays in full and I refrained from appending additional explanations as well as from cutting out certain elements. The titles of the essays can be seen from the table of contents. The reader who is interested in only one of the topics discussed in this thesis can stick to the respective essay chapter without missing any required information.

Even though this is a doctoral thesis consisting of individual essays, the whole book shall still be more valuable than the sum of the essays it consists of. Therefore, I enrich this thesis through four elements going beyond what is covered in the essays. The first element is a rather detailed descriptive analysis of the *Microdatabase Direct Investment* provided by the German central bank. This dataset has been used in four of the five essays and it is one of the best conceivable reference points for empirically analyzing tax questions. The descriptive section, covering investment, financing and structure trends, can be found right after this introduction. The second element comprises five systematic overviews of the empirical tax literature, following up on the topic of each single essay one by one. These systematic overviews outline the data, methodology and key results for each eminent empirical tax paper related to the respective preceding essay. Thus, separating the essays from each other, the systematic literature reviews cover the impact of corporate taxes on investment, the impact of source taxes on investment, the impact of tax loss treatment on investment, the impact of

corporate taxes on financing decisions, and finally the impact of corporate taxes on group structuring and location decisions. The third element is a compact overview showing the hypotheses and findings of all five papers one by one. This general review can be found at the end of this thesis' main section. The fourth element is an additional overall appendix, showing the most important tax data I have researched for my essays. These are the corporate income tax rates of 190 countries from 1996 till 2010 and bilateral source taxes on dividends, as well as tax crediting relationships between 58 countries from 1996 till 2008. The electronic form of this data is available from the author upon request.

All five essays of this doctoral thesis build on code programmed into the statistics software *Stata*. A considerable part of this work's creativity has flown into writing and streamlining this code. More often than not, what is obvious in reality or understandable in the tax law requires some brain power to be translated into programming language. This refers to the identification of widely ramified group structures, the aggregation of tax characteristics on the group level, the merge of two 42,978 cell matrices with a vast firm-level micro dataset and several other methodological challenges. It is tempting to explicitly show how these technical hurdles have been cleared. The increase in size of this thesis by up to several hundred pages would only be a tolerable side effect. The reason why I refrain from it is that such an amount of programming code might be interesting only to a rather small group of readers, i.e. only those who somehow feel at home in taxes, economics and informatics. On request, the author gladly makes the code available to those who operate in that triangle and who might want to perform a re-estimation.

Hard scientific work and great satisfaction can go hand in hand. It was a privilege and a great pleasure to contribute in extending the scientific frontier. I enjoyed conducting empirical tax research and I hope this feeling shines through all the five essays presented in the following.

2. General Descriptives

This general descriptive section provides an overview of the economic environment all five essays refer to. While some of the papers build on specific years, sectors or countries, this section aims at building a bridge between all of them. It presents descriptive statistics on the tax rates and on variables from all three fields of interest concerning tax effects, i.e. investment, financing and group structuring. The time span in this section covers the years 1996 till 2009, because all five essays use years from this period.

The tax rates are based on information from tax handbooks and national tax codes. All firm information is based on the outbound side of the Microdatabase Direct Investment (MiDi) by the German central bank. For this section, the MiDi information has only been adjusted or limited where it was absolutely necessary in order to properly reflect the real development.

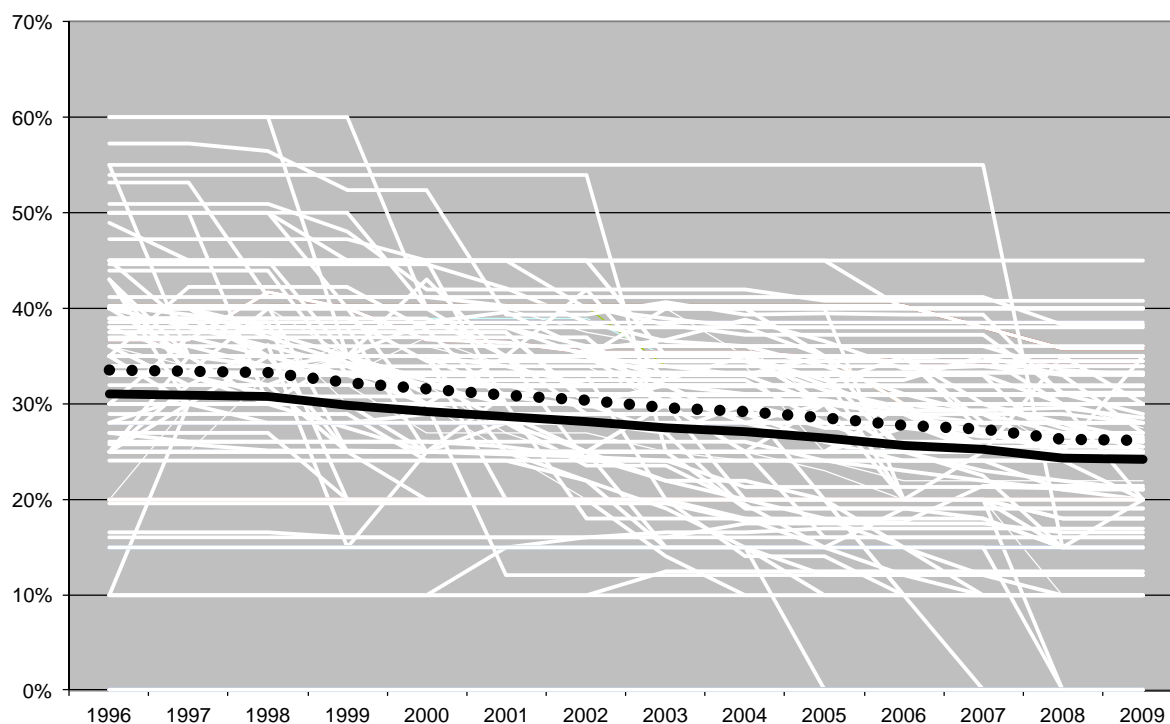
Therefore, the common reporting threshold of total assets amounting to at least EUR 3 million is applied. Furthermore, no partnerships or sole practitioners are taken into account, only corporations. If there were double entries for a corporation in a business year, caused by stub periods or erroneous reporting, one of these entries was deleted.

The business sectors of farming and mining are disregarded because they are subject to specific tax rules in certain countries. The balance sheet information of companies belonging to the financial industry is not directly comparable to such information from other industries. That is why the financial industry is also disregarded in this section's figures. Additional information on trends if the financial industry were to be included is provided in the text or in footnotes. It shows that the graphs would remain qualitatively rather similar.

Figure 2-1 shows the development of corporate income tax rates for 189 countries between 1996 and 2009. The white lines show the corporate income tax rate development for each country. Table A-1 in the Appendix shows all tax rates used in this figure. The solid black line is the country average. The dotted black line is the country average when leaving out the 14 countries which always had a zero tax rate during the relevant time period.¹

As can be seen from Figure 2-1, the corporate income tax rates decreased between 1996 and 2009 on average. Across all countries, the average corporate income tax rate decreased by 7.15 percentage points from 31.00% in 1996 to 23.85% in 2009. Disregarding the zero tax rate countries leads to an upward translation with a development of the 175-country average tax rate from 33.48% to 25.76%, corresponding to a decrease of 7.72 percentage points.

¹ The countries among the 189 analyzed here, which have a zero tax rate between 1996 and 2009 are Andorra, Anguilla, Bahamas, Bahrain, Bermuda, Cayman Islands, Maldives, Marshall Islands, Micronesia, Nauru, Palau, Turks and Caicos Islands, United Arab Emirates and Vanuatu.

Figure 2-1: Corporate income tax rates in 189 countries

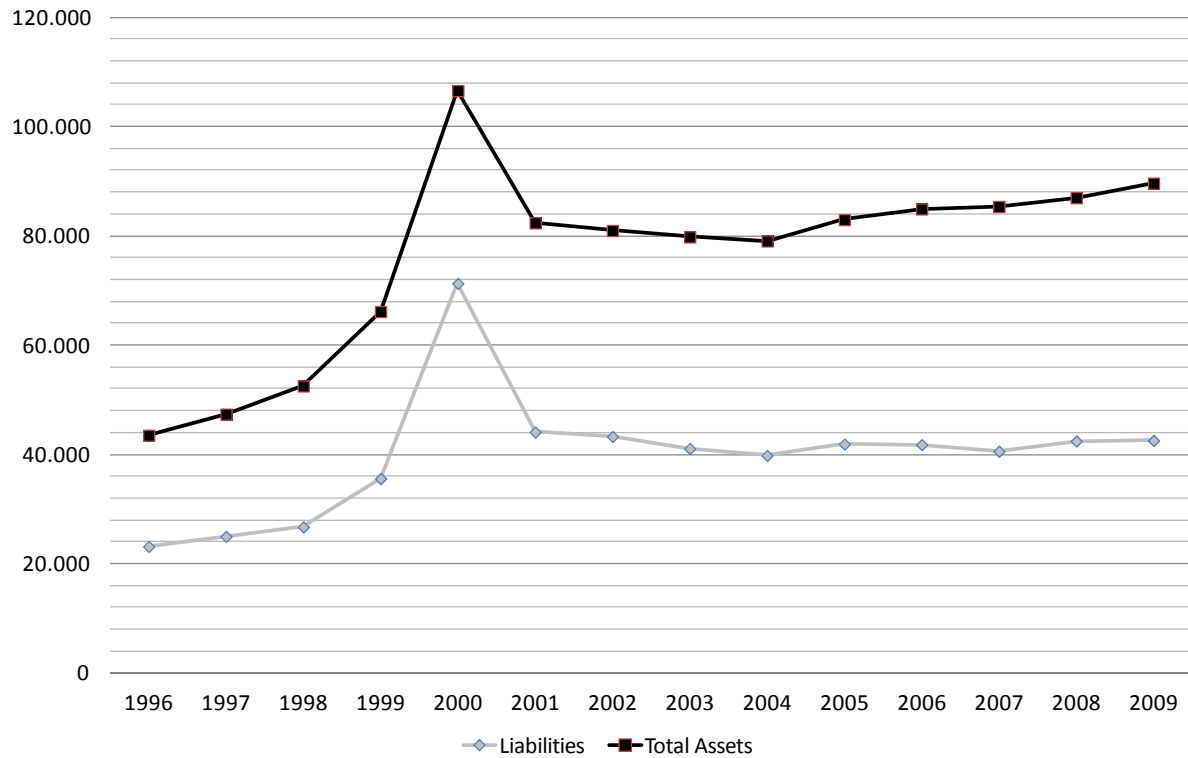
Sources: IBFD Global Corporate Tax Handbooks, Tax Guides by big four audit companies, national tax laws.

The key takeaway from Figure 2-1 is that during these 14 years the average corporate income tax rate decreased by more than seven percentage points. This result is taken up further below when reflecting on possible connections to corporate investment decisions.

Figure 2-2 shows the mean of total assets and total liabilities in subsidiaries abroad, belonging to groups headquartered in Germany. Like the other figures presented below in this section, Figure 2-2 is based on the outbound side of the German central bank's Microdatabase Direct Investment (MiDi). As can be seen, both the total assets and the total liabilities of the average subsidiary increased during the analyzed time span from 1996 to 2009. In 1996, the average subsidiary observable in the outbound MiDi dataset had total assets in the amount of EUR 43.5 million. In 2009, the average subsidiary showed total assets of about EUR 89.6 million. Thus, in nominal values, the average subsidiary size has more than doubled during the 14 years observed here. The temporary peak in the year 2000 reflects the boom right before and its correction right after the burst of the millennium bubble. The graph would show a similar upward trend if the financial industry were to be included; it would only be inflated with total assets increasing from EUR 145 million in 1996 to EUR 260 million in 2009. In addition to the size of the average subsidiary, the number of observed subsidiaries has also strongly increased from 12,323 in 1996 to 23,348 in 2009. This is illustrated further below in this section, when describing structural issues.

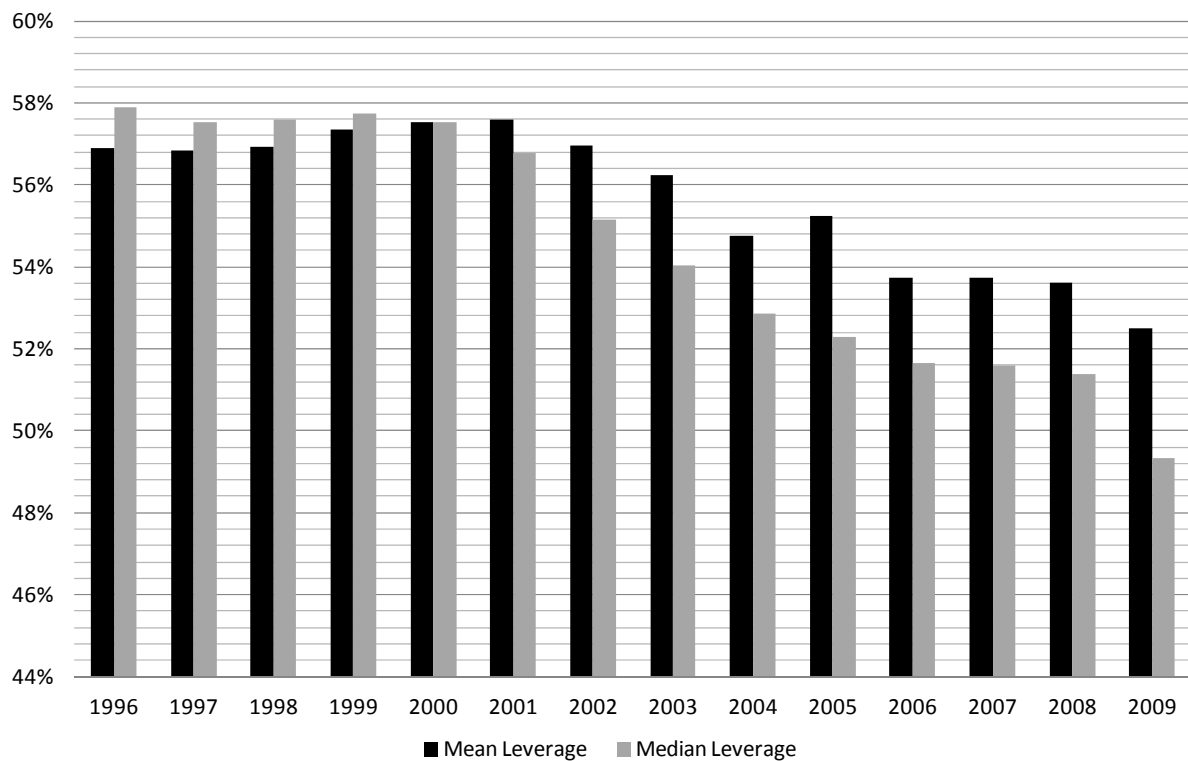
2. General Descriptives

Figure 2-2: Mean of a subsidiary's total assets and total liabilities [EUR '000]

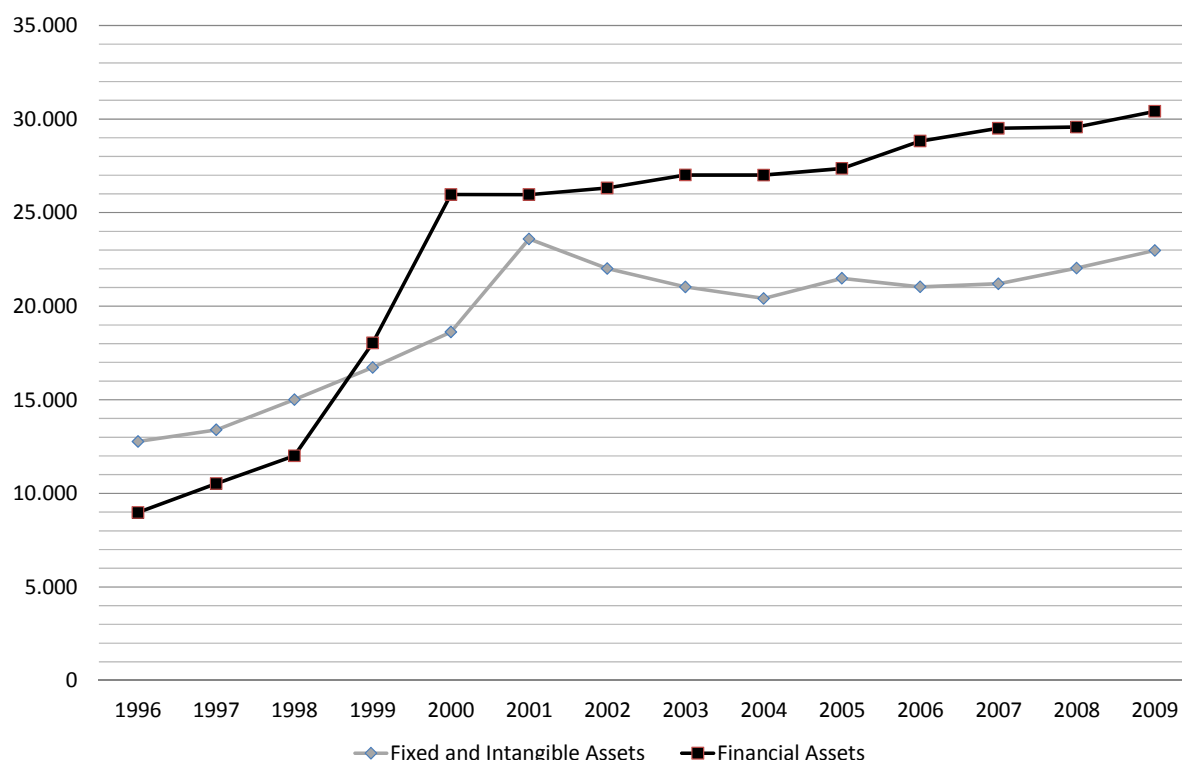


Source: Outbound side of the German central bank's Microdatabase Direct Investment (MiDi).

Figure 2-3: Mean and median liabilities/total assets



Source: Outbound side of the German central bank's Microdatabase Direct Investment (MiDi).

Figure 2-4: Mean of fixed and financial assets [EUR '000]

Source: Outbound side of the German central bank's Microdatabase Direct Investment (MiDi).

Apart from a first insight into investment sizes, Figure 2-2 also illustrates a financing aspect. As can be seen, about one half of the total assets are debt-financed. The liabilities shown here in Figure 2-2 include both internal and external debt. The increasing spread between the two curves of Figure 2-2 indicates that there is a slight decrease in the leverage over time. This can be seen even clearer in Figure 2-3.²

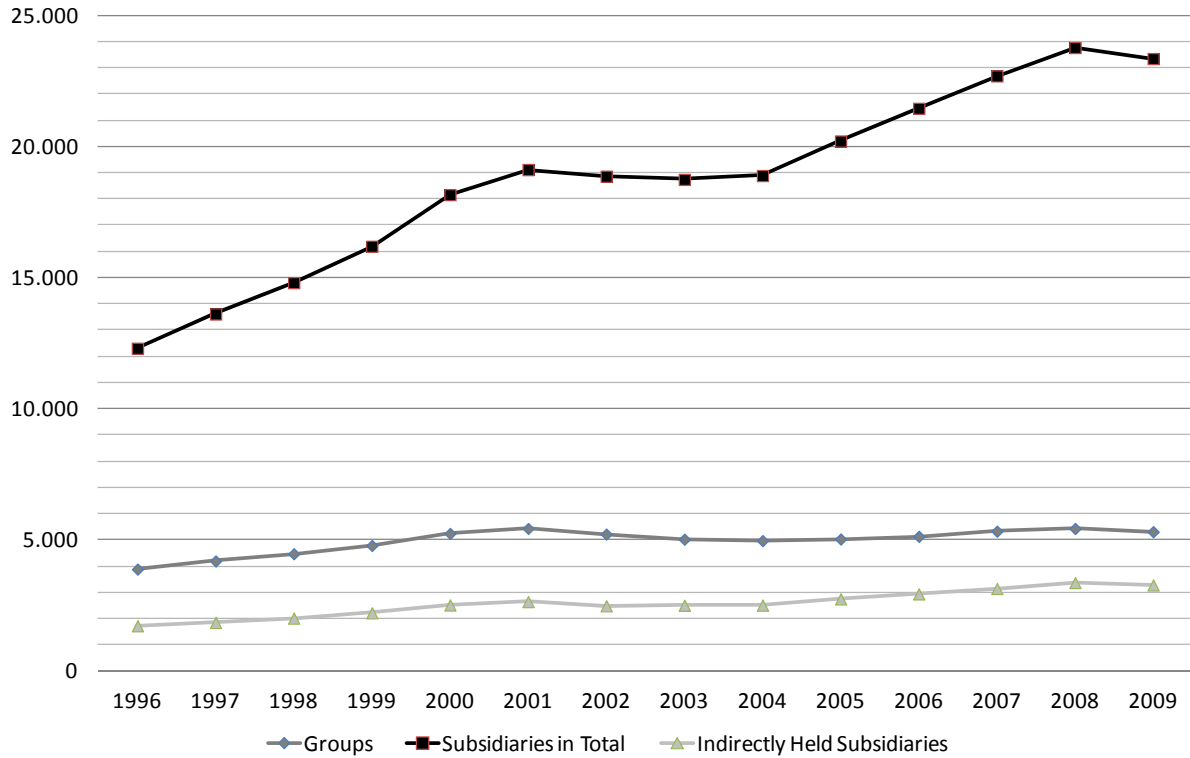
Figure 2-3 shows the leverage of the mean and the median firm on an annual basis. The leverage is the ratio of total liabilities to total assets. Both the mean and the median leverage decreased over time. Thus, multinational subsidiaries seem to gradually finance their new investments to a larger extent than they used to through equity or by retained earnings. The mean (median) leverage was 56.91% (57.88%) in 1996 and it decreased to 52.50% (49.32%) in 2009.³

Figure 2-4 provides additional details as to what can be seen in Figure 2-2 because it does not show the trend in total assets, but in two of its most important elements: fixed and intangible assets as well as financial assets. The remaining part of the total assets is covered by current assets and other elements, which are not analyzed here. Figure 2-4 shows a strong increase in

² When including the financial industry in the analysis, the liabilities also move in parallel to the total assets with a starting average of EUR 117 million in 1996, two temporary peaks of EUR 226 million in 2000 and EUR 228 million in 2008, and a value of EUR 188 million in 2009.

³ Including the financial industry leads to slightly higher leverages with mean (median) values of 56.98% (58.35%) in 1996 decreasing to 52.87% (49.45%) in 2009.

Figure 2-5: Groups, subsidiaries and indirect participations



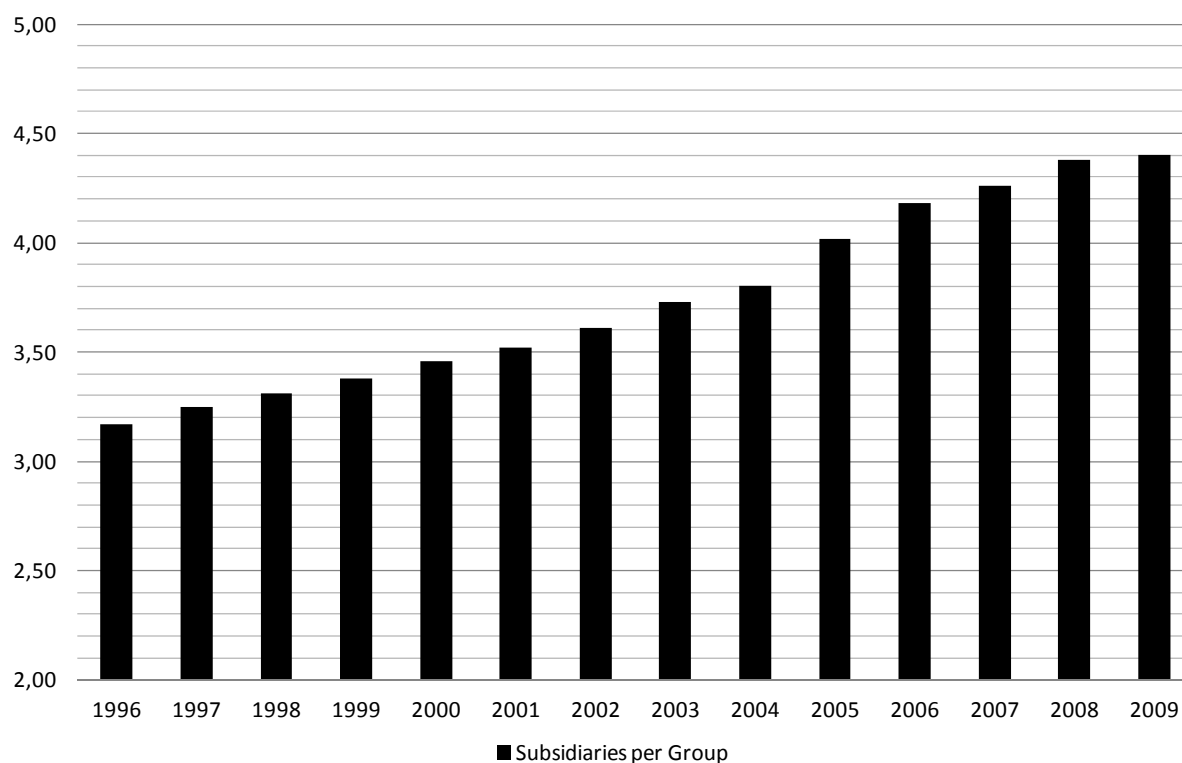
Source: Outbound side of the German central bank's Microdatabase Direct Investment (MiDi).

both asset categories. The average amount of fixed and intangible assets in a foreign subsidiary increased from EUR 12.7 million in 1996 to about EUR 22.9 million in 2009.

The average financial assets per corporation increased even steeper, from EUR 8.9 million in 1996 to EUR 30.41 million in 2009.⁴

Figures 2-5 and 2-6 focus on the size of the sample and the structure of the groups and corporation it consists of. As mentioned above, the number of observable subsidiaries increased strongly. Figure 2-5 shows that, in 1996, the carefully adjusted sample consisted of 12,303 subsidiaries, whereas in 2009 there were 23,348 subsidiaries. This is an increase of more than 89%. The number of groups did not increase as strongly. With 5,309 groups, there were 36.7% more groups in the dataset as compared to the 3,884 groups in 1996. The trend of indirectly holding subsidiaries instead of creating direct relationships to the headquarters increased parallel to the trend concerning the overall number of subsidiaries. 1,726 subsidiaries were held indirectly in 1996, whereas 3,283 subsidiaries were held indirectly in 2009. This is an increase of 90.2%. These trends persist also when including the financial industry.

⁴ Including the financial industry in this analysis of asset categories leads to a similar trend with mean fixed and intangible assets per subsidiary increasing from EUR 12.4 million in 1996 to EUR 22.5 million in 2009 and mean financial assets increasing from EUR 21.2 million in 1996 to EUR 69.5 million in 2009.

Figure 2-6: Average number of subsidiaries per group

Source: Outbound side of the German central bank's Microdatabase Direct Investment (MiDi).

Figure 2-6 shows that the average number of subsidiaries per group increased from 3.17 in 1996 to 4.40 in 2009. Therefore, not only the individual subsidiaries became bigger in terms of total assets, as can be seen from Figure 2-2, but also the groups consisting of such subsidiaries grew.⁵

In the introduction I stated that this doctoral thesis shall only be enriched by elements going beyond the five essays if these elements generate a clear additional value. What is the value added of this overall descriptive section? It shows the economic environment where tax effects shall be identified in and, even more importantly, it shows what tax effects actually look like. Figure 2-1 shows the general decrease in corporate income tax rates across 189 countries. Figure 2-2 shows the increase in total assets in an average firm. Thus, the tax effect on investment is not whether or not there is investment or growth in investment at all, but rather that the investment projects increase more strongly when and where the tax conditions are favorable. The regressions performed in the essays take place in a dynamic environment. Tax rates seem to decrease in almost every country and foreign direct investments are generally on the rise. The speed and size of these effects, however, differ. They annually differ on a firm basis. The question to be answered regarding the tax impact on investment is to what extent low tax rates or other favorable tax regulations exert an effect on those firms

⁵ With 3.33 in 1996 and 4.64 in 2009, including the financial industry leads to slightly higher average numbers of subsidiaries per group.

which are subject to them, when controlling for other macro influencing factors as well as for firm-specific characteristics.

A similar analytical setup can be observed concerning the financing decisions of firms. As can be seen from Figure 2-3, corporations tend to use less and less debt for financing their operations. This is already revealed by the descriptive output. The interesting question, however, is to what extent the firms subject to specific tax rules such as the interest barrier changed their financing differently from other firms. By scrutinizing what can and cannot be learned from the figures shown above, it becomes clearer what empirical tax research by means of regressions aims at analyzing. Proper, logical and clear identification of the treatment and control groups are of primary importance.

What has been outlined for the tax effect on investment and on financing can also be put forward concerning the tax effect on group structuring. Figure 2-6 shows that the number of a group's subsidiaries on average tends to increase over time. Nevertheless, the introduction of a group taxation rule might make groups split up their operations in a country into more new subsidiaries as compared to the scenario where such a rule had remained absent. The same applies in an analogous way to the identification of a change in withholding taxes on a group's structuring choices. Besides other aspects, it is the identification of the treatment group and the control group which matters.

The impact of taxes on corporation's decisions in the fields of investment, financing and structuring is to be analyzed in the five essays to follow. I hope that this preceding descriptive section contributes to the awareness of what it takes to identify such effects. At the same time, it shall highlight that taxes are one parameter for decision-making in a world characterized by multiple influencing factors.

3. The Impact of Corporate Taxes on Investment

- An explanatory empirical analysis for interested practitioners - ^{6 7}

Abstract: The scientific literature provides evidence for an impact of company taxes on investments. Practitioners, however, have a skeptical view on the meaning of this effect. This paper builds the bridge between research and the interested practice by providing detailed descriptives and clearly showing how the effects are derived. It analyzes the development of German multinationals' direct investments abroad and of foreign multinationals' investments in Germany from 1996 till 2008. A split along federal states is applied. Starting from the analysis of the basic tax effect, the paper also covers current research topics when analyzing the impact of existing loss carryforwards and when tracing holding structures. The descriptive statistics already show that cross-border investments have increased strongly. The development of Baden-Württemberg mainly corresponds to that of Germany. The impact of taxation on investments is negative. A ten percentage points higher corporate tax rate leads to about five percent lower investments, measured by fixed assets. This effect is smaller for those companies which show loss carryforwards. A lower tax rate at a specific location especially seems to attract holding companies, which are applied for tax efficient group structuring.

Keywords: Corporate Taxation, Foreign Direct Investment, Empirical Analysis, Multinational Firms

JEL Classification: F23, H25, H32

⁶ In June 2012, the paper has been published as ZEW Discussion Paper 12-040. As of autumn 2012, it is under review for the journal *Perspektiven der Wirtschaftspolitik*. In 2011, the paper has been presented at ZEW's Förderkreis für Wissenschaft und Praxis in Mannheim and in 2012 it has been presented at the ZEW Wirtschaftsforum in Mannheim.

⁷ I thank Friedrich Heinemann for valuable suggestions. I also thank the Förderkreis für Wissenschaft und Praxis am Zentrum für Europäische Wirtschaftsforschung e.V. for their kind support. My thank-you also goes out to the Deutsche Forschungsgemeinschaft who sponsor the project „Unternehmensbesteuerung und Konzernstrukturen“, which provided the context within which this essay was written. I would like to thank the Deutsche Bundesbank for granting access to its research centre and subsequently the direct investment data, as well as for being an exceptional host.

3.1 Introduction

Investment behavior is influenced by corporate taxation. High taxes hinder investment, whereas low tax rates favor it, especially within a context of cross-border direct investment. This claim is backed by a broad array of highly credible scientific literature.⁸ Nevertheless, in the public debate of tax practitioners, it can by no means be considered part of the common consensus. Time and time again other determinants of direct investment are highlighted. The latter may stem from a desire for market development, whereby any relevance of the taxation factor is denied. Should a car manufacturer identify China as an emerging market, the medium-sized company supplying it has no other option but to invest there. It has to do so regardless of China's taxation policy. The great strength of the econometric discipline lies in its capacity to incorporate different effects such as the suspected 'China Effect' in its mathematical models.

Within such a framework this paper seeks to identify the econometric and micro economical approaches best suited for verifying the effect of taxation on direct investment behavior. Such is without neglecting any other influencing factors and recognizing areas that continue to exemplify problematic results. An analysis of German inbound and outbound direct investment is added. Findings on Germany as a whole are observed in contrast with the data of the strongly export orientated federal state Baden-Württemberg. This comparison indicates the overall validity of the findings. The paper considers firm's heterogeneity regarding their respective profit and loss histories and may therefore be considered part of the cutting edge of current research efforts. With its analysis of holding companies and associated corporate group structuring this paper enters into a field that requires further detailed research in coming years.

The foundational data shows the direct investment development of German parent companies abroad and that of foreign parent companies in Germany. Only limited liability companies are considered. The paper is structured in a mirror image style: The first part examines outbound investment and the second inbound investment. Both start off with a presentation of descriptive nature. The timeline for direct investment is shown for Germany as one and for the individual federal states. Special attention will be paid to the foreign investment of Baden-Württemberg firms and any investment of foreign firms within Baden-Württemberg. The timeline in question consists of 13 years and ranges from 1996 to 2008. This paper makes a

⁸ So called meta studies summarize results of past investigations into the effect of tax on direct investment. Hereby they calculate the average 'to be expected effect'. See De Mooij und Ederveen (2003) and Feld und Heckemeyer (2011).

conscious effort not to formulate an economic analysis of the most recent economic crisis, but instead strives to highlight the overall trend of investment developments. The effect of taxation will be examined by means of a linear estimation method, which allows for the econometric function to be derived in a transparent way. The empirical section will firstly examine the effect of corporate taxes on investment. Then existing tax loss carryforwards and investment structure decisions will also be illuminated.

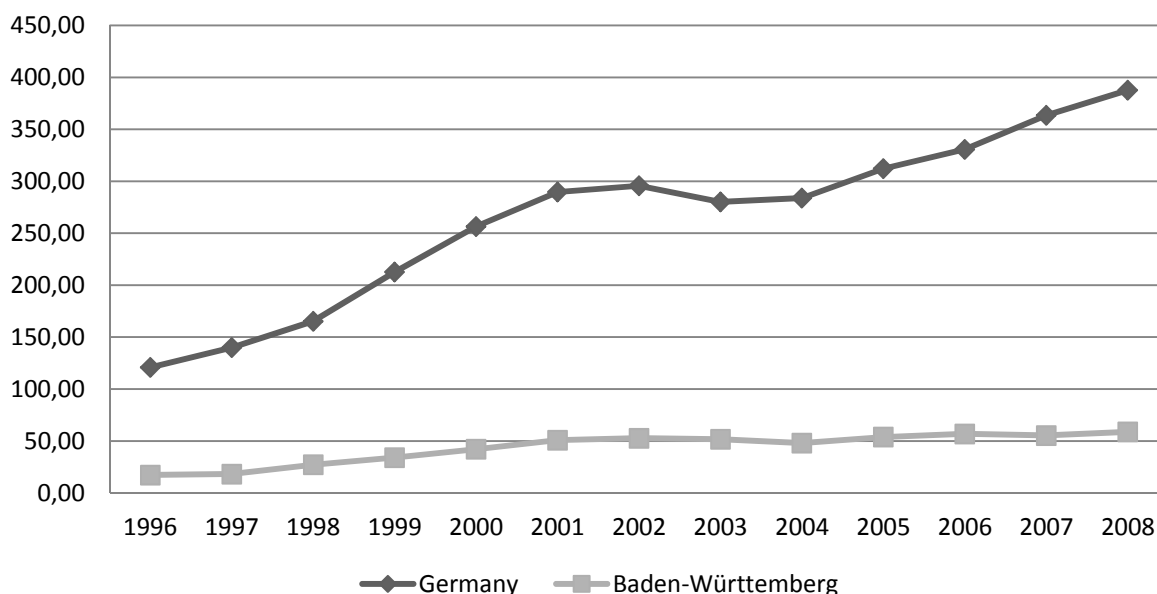
3.2 Influence of Corporate Taxation on Investment Behavior

3.2.1 Investment of German companies abroad

This paper's first analytical step will look at German parent corporations' investment abroad. The analysis is based on micro data. Unlike with aggregated macro-economic data, micro data analyses bears the advantage that recognized characteristics of corporations can be taken into account. Investment is primarily a flow value. When looking at individual corporations' investment abroad however, stock values will have to be used, since only these are observable on the balance sheets. The dynamic will at a later stage be developed by econometrical estimations using the difference in observed stock values between two successive years. The resulting descriptive evaluation shows the development of the stock value 'fixed assets' and hereby reveals the extent to which German parent corporations are invested abroad. Intangible assets are included only to the degree to which they are activated on the balance sheets.

3.2.1.1 Investment development

Figure 3-1 illustrates the basic trend from 1996 to 2008 for Germany and Baden-Württemberg. The chart is based on the German Federal Bank's microdatabase direct investment (MiDi). It is mandatory for investors to report any cross border activity if their involvement constitutes 10% or more and the balance sheet of the respective foreign subsidiary exceeds EUR 3 million. These foreign subsidiary balance sheets are made available in standardized form on an annual basis. The fixed asset values are taken from these balance sheets. As can be seen, fixed assets of German corporations abroad have increased by more than a threefold factor (3.25) from EUR 120 bn. in 1996 to EUR 390 bn. in 2008. Multinationals based in Baden-Württemberg have increased their assets abroad by an even higher factor of 3.4: from EUR 17 bn. to EUR 59 bn. in the last 13 years.

Figure 3-1: Outbound fixed assets in EUR billion

The ascent of both curves can be explained by the increase in subsidiaries abroad and the increased amount of assets these subsidiaries have at their disposal. In 1996, the average foreign subsidiary had EUR 13.6 billion in fixed assets. By 2008, this figure had increased to EUR 21.5 billion. From 1996 to 2008, the number of counted foreign subsidiaries increased from 8,870 to 18,013.

The number of foreign subsidiaries of Baden-Württemberg companies has increased from 1,572 in 1996 to 3,641 in 2008. The average asset values of these subsidiaries has also seen an increase from EUR 10.9 billion in 1996 to EUR 16.1 billion in 2008. The average foreign subsidiary asset value of Baden-Württemberg's corporations is lower than that of Germany as a whole; possibly because numerous medium or even small sized Baden-Württemberg corporations have foreign subsidiaries.

Figure 3-1 shows that foreign investment has increased. It would be mere speculation to make the drop in corporate tax rates responsible for this increase in foreign direct investment. Other plausible reasons include the increased economic performance of foreign locations, increased inflation or currency effects. When analyzing tax effects, it is also unsuitable to differentiate between target countries, since their tax rates vary over time and between one another. If anything, only an average effect may be identified.

3.2.1.2 Comparing investment in the different German federal states

Figure 3-2 shows in regular six year intervals which German federal states the investments into foreign subsidiaries stem from.⁹ Baden-Württemberg's share increases from 14% in 1996 to 18% in 2002 and eventually comes to 15% in 2008. Nordrhein-Westfalen based companies have the highest share of foreign subsidiary investment in all 3 years. Although Hessen's share has decreased somewhat, one must keep in mind that banks are not included in the observations.

As seen in Figure 3-1, the overall volume of investments has increased substantially. The volume of Figure 3-2's first diagram corresponds to the EUR 120 billion. The same goes for Figure 3-2's third diagram and the EUR 390 billion from 2008. In 2002, the overall assets held by foreign subsidiaries were some EUR 296 billion.

Looking at Baden-Württemberg, the percentages translate to EUR 17.2 billion (=14%) in 1996, EUR 52.7 billion (=18%) in 2002 and EUR 58.7 billion (=15%) in 2008. The volume of foreign investment by corporations in Bayern and Baden-Württemberg are fairly similar. Niedersachsen comes 5th with regards to foreign investment followed by Hamburg, Rheinland-Pfalz and Berlin.

Figure 3-2a: Outbound fixed assets 1996

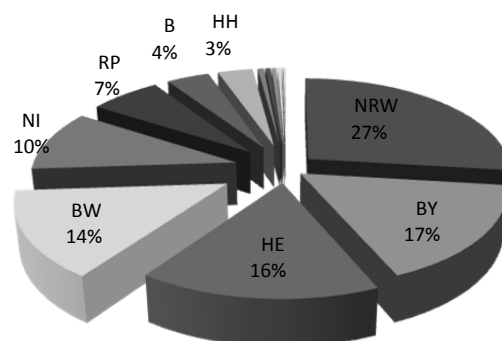


Figure 3-2b: Outbound fixed assets 2002

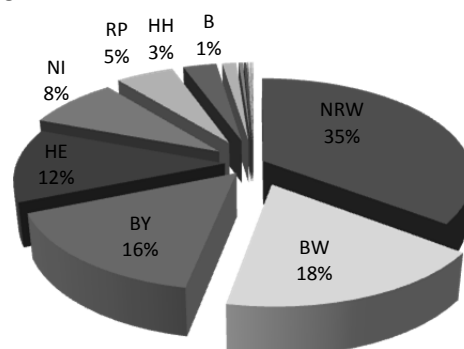
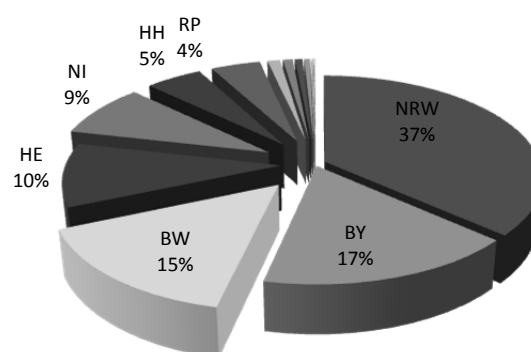


Figure 3-2c: Outbound fixed assets 2008



⁹ It is worth pointing out that the described increase in German assets abroad from 1996 to 2008 may be subject to the influence of exchange rate effects. Towards the end of 1996, most investment targets of German investors' balance sheets were in foreign currency and had to be converted to D-Mark. As a result, some of the changes in investment may merely be due to fluctuating exchange rates rather than actual investment activity. The Bundesbank has converted D-Mark values into euro values for the years 1996 to 1998.

3.2.1.3 Corporate Tax development

So far investments have only been looked at in terms of assets held by foreign subsidiaries. Considering the fact that ultimately the effect of corporate tax rates on investment is to be determined, the development of corporate tax rates has to be shown. Figure 3-3 illustrates the development of corporate tax rates some of those countries with the highest average stock of assets invested by German parent corporations. The investment development is also graphed for purposes of comparison.

What can be seen in Figure 3-3 is that whilst investment is on the rise, the average corporate tax rate of all countries falls. As a result, the used average corporate tax rate is reduced to that of the most relevant countries only, since a changing corporate tax rate in a country that receives no German investment may otherwise distort the picture. The corporate tax rate used in the chart is calculated out of that of 10 different countries. Included are those that traditionally receive a lot of investment from German companies such as France, Great-Britain, the Netherlands, Austria, Spain and the USA. The BRIC nations are represented by Brazil, China and Russia. Singapore completes the 10-country-list as a popular holding location. In 1999, the average of these countries' corporate tax rates was 35.0%. By 2008 it had sunk to a level of 28.0%. Investment increased, whereas average corporate taxation rates fell.

A credible effect may not yet be derived from this chart. One may for instance argue that should investment increase for reasons other than corporate tax rate changes, they would still have to be carried out somewhere. A parallel decrease in corporate tax rates may possibly be coincidental. On a descriptive level, a clearer picture may be obtained if both the development of outbound investments as well as tax rates are shown per target country. Such is realized in Figure 3-4.

In Figure 3-4, the (prior to this point) hidden thought of competition between the countries has now been incorporated. Perhaps multinational corporations have already decided to increase their foreign activity. The second step may be concerned with the question of where such an expansion may take place. This expansion could mean the expansion of existing subsidiaries or the setting up of additional new ones. The potential target countries are therefore in competition over such investments. A low or decreasing tax rate may function as a beneficial argument in such a competition.

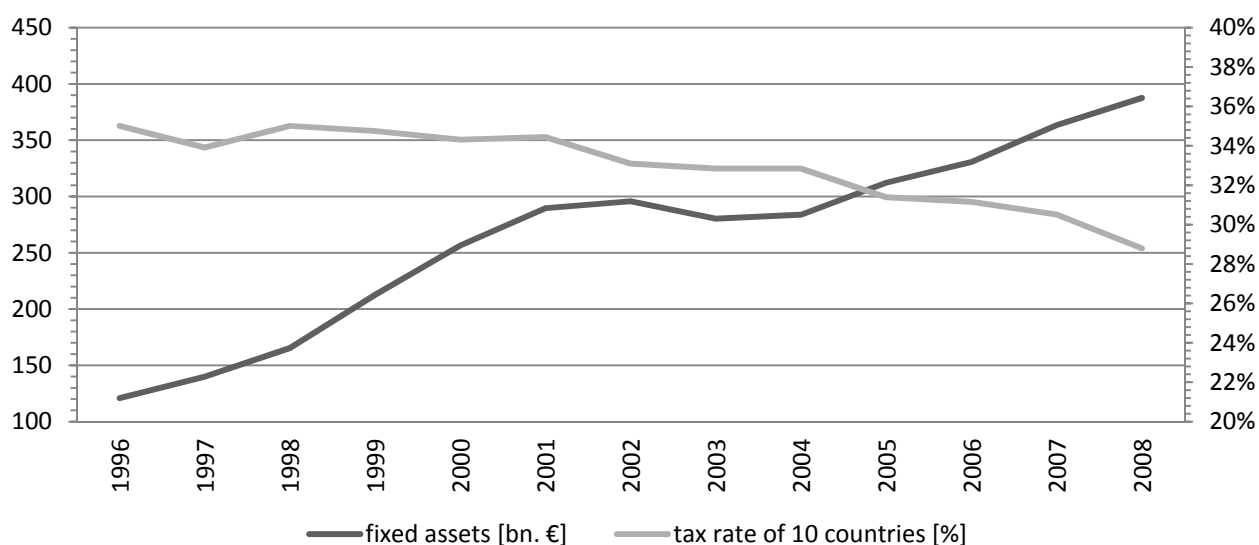
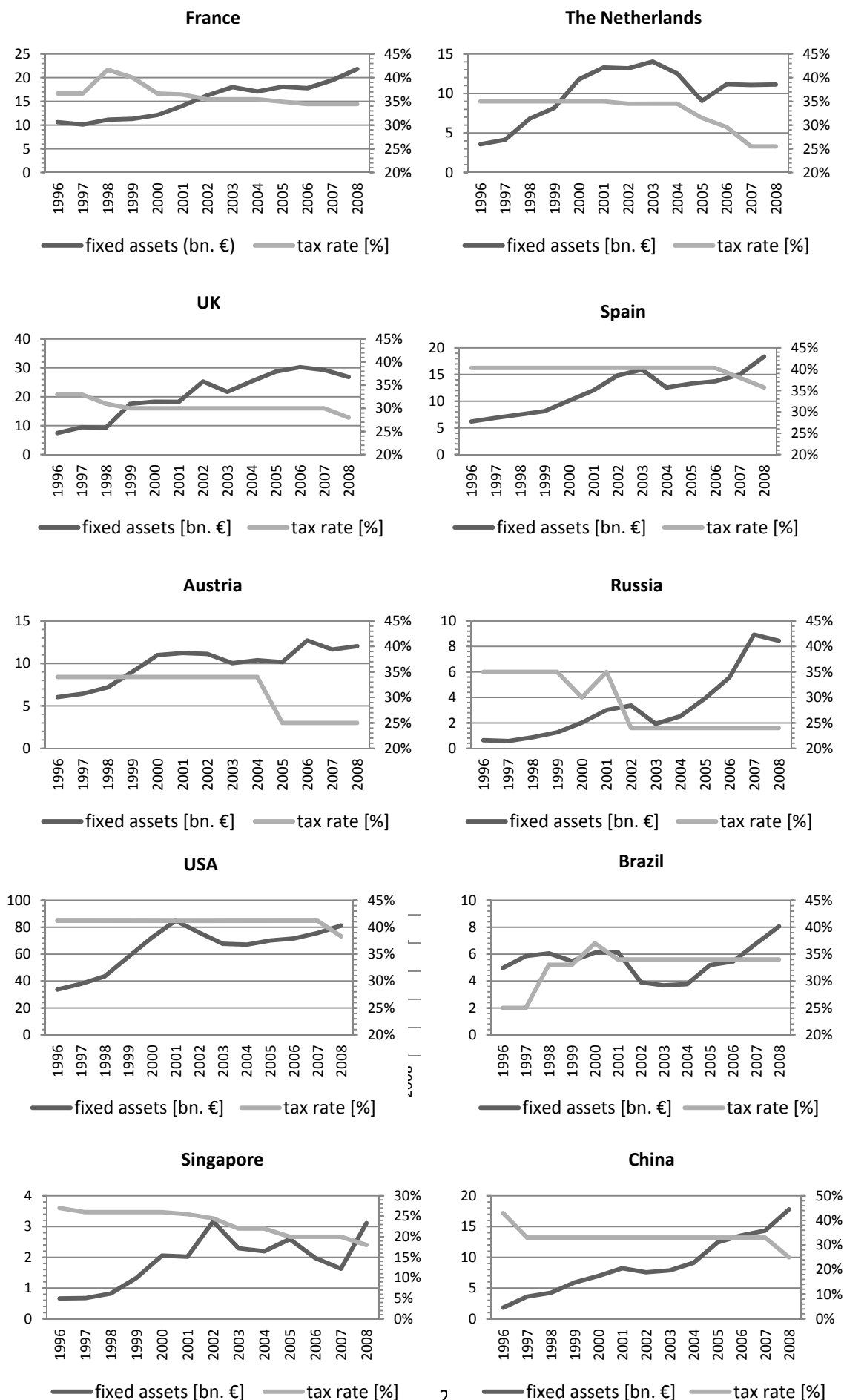
Figure 3-3: Outbound fixed assets in EUR billion – all export countries

Figure 3-4 is made up of ten different diagrams, each of which show the development of investment and the corporate tax rate in a different country. In each of those countries the extent of investment by German corporations is larger in 2008 than it was in 1996. In nine out of these ten countries the corporate tax rate is lower in 2008 than it was in 1996. An overall trend exists. Brazil's increased corporate tax rate marks an exception: From 25% in 1996 to 34% in 2008. It is nevertheless apparent that the amount of change as well as the actual trail of the curves differs from country to country. Most countries show a consistent increase in incoming investment. Brazil, the Netherlands, Spain and the USA however also show temporary declines.

In Austria, Spain and the USA, the corporate tax rate has been cut only once throughout the relevant time period. The other countries have cut their rate in several steps. Brazil, France and Russia's rates have seen periods of temporary increase. With a drop of 18 percentage points from 43% in 1996 to 25% in 2008 China records the largest corporate tax rate cut. China is followed by the Netherlands who cut their rate by 9.5 percentage points. Countries with an also significant cut rate of 9 percentage points are Brazil, Austria, Russia and Singapore. One must not overlook, however, that both the initial 1996 rate and the 2008 rate of corporate taxation significantly differ between the respective countries. In France, Spain and the USA, the corporate tax rate remains between 34% and 41% throughout the entire time period, whereas Singapore for example decreased its rate from 27% in 1996 to 18% in 2008.

3. The Impact of Corporate Taxes on Investment

Figure 3-4: Outbound fixed assets on a per country basis in EUR billion



An effect of tax on investment may on the basis of these pictures be suspected, but not determined with absolute certainty. The strong 2005 increase in investment in Austria may well have been driven by the parallel cuts in corporate taxes. The tax cuts from 2004 onwards in the Netherlands could feasibly have been responsible for stopping the downwards trend of investment. Considering a certain time lag in corporations' investment behavior, the increased investment in Russia may also be attributed to decreased tax rates.

Much like before, the one point of critique regarding the charts' credibility is the lack of attention directed towards other factors possibly influencing investment. In order to tackle this problem, econometric estimation methods need to be drawn upon.

3.2.1.4 Empirical investigating into the effect of tax rates on investment

The estimation's merit depends on the extent and precision with which all the factors influencing investment are included. Two approaches allow several of these influencing factors to be covered without having to collect any data. First of all, it seems very likely that a foreign subsidiary with a large amount of assets in one year will also have such a high level of assets in the following year. Therefore, instead of using the absolute level of assets, the first differences between investments serve as the dependent variable. In order to formulate a valid statement, all explanatory (= independent) variables have to be applied in first differences as well. Therefore, it is the tax rate difference between two years and not the tax rate itself that is included in the estimation.¹⁰

The second approach neutralizes business cycle fluctuations and other extraordinary temporal effects. This is accomplished with the help of so-called annual dummies. For every year a variable is created that is one for this exact year and zero for all others. The effect of unusually high investment in 1999 for example would be recorded by the annual dummy for 1999. Usage of annual dummies would only prove to be problematic if all tax rate cuts were to occur in a single year. As can be seen from the above charts, this is not the case.

Beyond these specification details, additional factors driving investment have to be thought of; for instance GDP, firm's profitability and inflation. Country dummies may not be used here, as annual dummies and country dummies together would cover up any tax rate effects. The remaining option is to check for characteristics of the individual countries. This means

¹⁰ See Wooldridge (2009) S. 393 ff. for a more technical explanation of the estimation in first differences.

including individual influence factors in the estimation procedure. As outlined above, these are applied in first differences.

GDP is supposed to be the most important control variable. The first difference detects GDP growth. It may represent a proxy for the size or development of the foreign target market. Controlled hereby is amongst others the talked about ‘China-Effect’. GDP per capita is also taken into account, which provides an insight into the extent to which domestic consumers can actually afford the given produce. At the same time it serves as a proxy for labor costs. The individual firm’s profitability of the currently considered period and the preceding period are also taken into account. One may assume a company that was profitable in the foregone period to invest more than an unprofitable company. As a standard controlling instance, the inflation rate is also included. Larger currency fluctuations may have an effect on the values of the fixed assets, as these have been converted into euro values. A currency variable is therefore created. It is standardized to the euro’s exchange rate deviation for the reference year of 1996. After all, different countries bear different levels of risk regarding investment. These investment risks are represented by the OECD’s country risk measure, which is also incorporated in the estimation procedure. Unlike in the first graph of Figure 3-4 where only ten counties are considered, now 51 countries are included in the estimation. The ten original ones from the earlier estimation are among these 51 countries. They comprise of the four BRIC countries, the 29 OECD member states of 2008, the 8 EU member states that are not part of the OECD as well as ten other countries.¹¹ For each of these countries the annual tax rate and the annual investment level is recorded. To ensure that the estimation focuses on those corporate groups with a genuine influence regarding decisions, a parallel focus on direct participation of 100% or directly held majority participation is put in place. The following Table 3-1 shows a descriptive analysis based on the observations used in the estimations as well as a description of the variables.

¹¹ The BRIC states are Brazil, China, India and Russia. The 2008 OECD members are Australia, Belgium, Denmark, Finland, France, Greece, Great Britain, Island, Ireland, Italy, Japan, Canada, Luxemburg, Mexico, New-Zealand, the Netherlands, Norway, Austria, Poland, Portugal, the Slovak Republic, South-Korea, the Czech Republic, Hungary, Spain, Sweden, Switzerland, Turkey and the United States of America. The added EU member states are Bulgaria, Estonia, Latvia, Lithuania, Malta, Slovenia, Rumania, and Cyprus. The additional ten countries are Bosnia and Herzegovina, Chile, Hong Kong, Israel, Croatia, Serbia, Singapore, South-Africa, Thailand and the United Arab Emirates.

3. The Impact of Corporate Taxes on Investment

Table 3-1: Descriptive statistics

Variable	Definition	Mean	Std. Def.
Fixed Assets	Total assets reported in the financial statements; measured in EUR '000.	11,430.38	61,491.70
Tax Rate	Statutory profit tax rate.	0.3118	0.0749
Withholding Tax	Withholding tax on dividends for the respective country/country pair.	0.0208	0.0450
Profitability	Profit or loss for the financial year as reported by the balance sheet divided by total assets before current profits.	0.0432	0.1260
BaWü-Dummy	Binary Variable indicating whether a subsidiary is situated in Baden-Württemberg (1) or not (0).	0.2280	0.4195
Loss carryforward exists	Binary variable indicating whether a subsidiary has a loss carryforward (1) or not (0).	0.2929	0.4551
GDP	Gross Domestic Product measured in billion current USD.	1,761.30	3,083.17
GDP per Capita	Gross Domestic Product per home country national; measured in current USD '000.	26,593.69	15,231.48
Inflation Rate	Inflation rate based on consumer prices (in %)	3.2160	4.7186
OECD Country Risk	OECD Country Risk Classification Method measures the country credit risk. Risk categories span from a low credit risk (0) to a high credit risk (7).	0.7394	1.3499
Currency Fluctuation	Exchange rate deviation from the euro. 1996 is nominated to 1.	1.2552	1.3482

The information is based on the 54,426 observations covered in the outbound estimations. The firm-specific variables are from the direct investment databank of the Deutsche Bundesbank. The tax variables are taken from the International Tax Handbook of the IBFD as well as the Worldwide Corporate Tax Guides of Ernst & Young. The *Gross Domestic Product*, the *Gross Domestic Product per Capita* and the *Inflation Rate* as well as the *Currency Fluctuation* are from the World Development Indicators Version 2011. The *Country Risk* rating is based on information from the OECD.

The following contains three tables with regression results. They are thematically structured and build on one another in that the first investigates the overall effect of tax on investment and the two following it concentrate on more detailed and in depth questions. The overall way to read these tables is identical and briefly summarized in the following. The dependent variable is the volume of fixed assets (Table 3-2 and 3-3) or a measure that indicates whether a subsidiary is a holding company or not (Table 3-4).

The tax rates used in the estimation are the statutory ones (nominal rates). The influence of special aspects on the tax base, such as a varying ways of tax loss recognition¹², are deliberately not made part of a general and straight forward approximated solution.¹³

¹² See Jacob, Pasedag und Wagner (2011) for a discussion of the relationship between the tax rate and loss carryforwards.

¹³ See Devereux und Griffith (2003) for a detailed path to creating effective tax rates. Elschner, Heckemeyer und Spengel (2011) use this method to calculate effective tax rates for European Union member states from 1998 to 2009. Becker and Fuest (2006) show that the attractiveness of a location may vary based on the chosen level of effective tax.

3. The Impact of Corporate Taxes on Investment

Table 3-2: Overall tax rate effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax Rate	-.532*** (.120)	-.460*** (.134)	-.520*** (.103)	-.453*** (.116)	-.657*** (.245)	-.629** (.260)	-.482*** (.132)	-.428*** (.148)
BaWü-Dummy							.025 (.081)	-.031 (.085)
BaWü x Tax Rate							-.242 (.225)	-.153 (.239)
Fixed Assets previous period		.486*** (.043)		.478*** (.037)		.418*** (.081)		.486*** (.043)
ln (Gross Domestic Product)	-.337 (.267)	.648 (.540)	-.347 (.246)	.501 (.503)	.008 (.218)	1.32*** (.430)	-.337 (.269)	.647 (.543)
ln (GDP per Capita)	1.10*** (.265)	-.274 (.538)	1.08*** (.245)	-.121 (.499)	.756*** (.240)	-.880* (.474)	1.10*** (.267)	-.273 (.541)
Profitability	-.053 (.038)		-.047 (.034)		-.060 (.084)		-.053 (.038)	
Profitability previous period	.096*** (.029)		.104*** (.027)		.123** (.063)		.096*** (.029)	
Inflation Rate	-.071 (.064)	-.014 (.033)	-.028 (.021)	.022 (.024)	-.154 (.146)	-.042 (.163)	-.071 (.064)	-.014 (.033)
OECD Country Risk	-.014 (.011)	-.007 (.012)	-.018* (.009)	-.009 (.010)	-.021 (.024)	-.012 (.026)	-.014 (.011)	-.007 (.012)
Currency Fluctuation	.054*** (.012)	.021** (.011)	.050*** (.011)	.023** (.010)	.041 (.032)	.019 (.031)	.054*** (.012)	.021** (.011)
Exclusively BaWü					✓	✓		
100% participation only	✓	✓			✓	✓	✓	✓
Majority participation only			✓	✓				
Direct participation only	✓	✓	✓	✓	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓	✓	✓	✓	✓
Observations	54,426	54,426	66,452	66,452	12,310	12,310	54,426	54,426
AR(1)-Test		.000		.000		.000		.000
AR(2)-Test		.470		.493		.232		.470

Dependent variable: ln (assets). The *year dummies* from 1997 to 2008 are included but not reported. Robust standard errors are in brackets. *, ** and *** point to significance of 10%, 5% and 1%. The numbers assigned to autocorrelation for the AR(1)- and AR(2)-Tests are p-values.

The Baden-Württemberg-Dummy is 0, unless the parent corporation of the subsidiary in question is based in Baden-Württemberg. The year dummies are not reported, but are nevertheless part of every estimation.

Panel estimation procedures are applied. In order to show the robustness of the results, the instrument variable estimations following Arellano and Bond (1991) (even columns in Table 3-2) are run in addition to the standard OLS procedure (odd columns in Table 3-2). For the instrument variable estimation the assets of the foregone period serve as the explanatory variable of the assets for the current period.¹⁴ All estimations are in first differences. This means that for both the dependent variable and the independent variables the difference to the

¹⁴ See Cameron und Trivedi (2009) S. 287 ff. for a general explanation of the Arellano Bond estimator.

prior year is used. This procedure has the advantage that it causes the size heterogeneity of the different subsidiaries to play a minimal role only. The procedure also highlights any changes a country may experience, such as a falling tax rate or rapidly growing GDP.

Looking at Table 3-2, it becomes apparent that taxes have in fact, as analytically expected a negative effect on investment.¹⁵ The tax rate effect on assets as a dependent variable is negative for all eight specifications as well as highly significant.¹⁶ The coefficients are semi-elasticities, given that the assets enter the equation in logarithm form and the tax rate doesn't. This means that a tax rate increase of one percentage point leads to a decrease in investment by half a percent. A by 10 percentage points higher (lower) corporate tax rate means a decrease (increase) of about 5 percent in investment. The extent of the observed effect is fairly constant and ranges from -.428 in column 8 to -.657 in column 5. In analogue terms: A by one percentage point higher corporate tax rate causes an investment reduction of between 0.428% and 0.657%. The effects show no systematic differences between the statistical estimation method and the dynamic one or between the recognition of 100% participations and majority participations.

The first four columns of Table 3-2 make all observations part of the estimation without differentiating between the different federal states. The estimations in columns (5) and (6) are based only on those subsidiaries, whose parent corporations are based in Baden-Württemberg. This explains the significantly smaller amount of observations included in the estimations of these two columns. Looking at the coefficient alone, columns (5) and (6) seem to indicate multinationals from Baden-Württemberg to be particularly tax sensitive. Columns (7) and (8) check whether such is actually the case on a statistically relevant level. The estimations in columns (7) and (8) therefore include all corporations and two additional variables. The BaWü-dummy marks those parent corporations that are situated in Baden-Württemberg. If it was positive and significant, it would mean that systematically more investment stems from Baden-Württemberg than is the case for the other federal states. The coefficient is insignificant, which renders any interpretation of its size or sign redundant. The second new independent variable is the interaction term. It is the product of the BaWü-dummy and the tax rate and is also not significant. A statistically significant deviation of the tax rate sensitivity of Baden-Württemberg based parent corporations in particular may therefore not be identified.

¹⁵ See e.g. Keuschnigg (2008) for an analytical derivation of the effect average tax rate and marginal effective tax rate on cross-border investment decision.

¹⁶ The respective valid tax rate of the foreign subsidiary is applied. Becker, Fuest and Spengel (2006) show that investment calculations on the basis of the whole group's average tax rate may lead to other decisions.

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The numerically larger effect in columns (5) and (6) is thus predominantly a result of the changed assembly, and/or the reduced extent of the sample. Baden-Württemberg based international parent corporations do not systematically differ in the way they include the tax rate effect in their investment calculations to parent corporations from other federal states.

Regarding the control variables, it becomes clear that profitability and assets of the foregone period have a significant and positive effect on investment in the current period. To be more precise, considerable increases in profitability and/or in assets of the prior period have a significant effect on the growth of assets in the current period because the estimation is in first differences. What is particularly interesting is the fact that profitability of the current period is insignificant, whilst that of the previous period is always highly significant. This seems intuitively sensible, since the money gained in the recent past may be used for new assets, whereas any gains from the current period have not yet been given the chance to be designated or decided upon. The temporal shift by one period can be explained by the fact that any signal indicating a certain subsidiary to be a lucrative investment opportunity will have to find its way to the parent corporation in Germany before any kind of investment can be authorized. For the effect of growing assets from the preceding period on current asset growth, the carried out aspects regarding profitability count as analogue.

A higher GDP per capita causes higher investment in some estimations. This can be explained by the following. An increasingly wealthy state becomes ever more attractive as a target market and thus receives more investment. Looking at the currency variable, the significant coefficient implies that one ought to check for this effect, too. As expected, the OECD country risk rating is negative. This is because countries with a high risk rating receive rather little investment. The effect is, however, rarely of significance. The frequent insignificance may be traced back to the lack of third world high level risk countries within the 51 countries that the estimations are based on.

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Table 3-3: Lower tax rate effect if loss carryforwards exist

	(1)	(2)	(3)	(4)	(5)	(6)
Tax Rate	-.637*** (.124)	-.553*** (.140)	-.612*** (.107)	-.523*** (.120)	-.636*** (.124)	-.608*** (.107)
Loss carryforward (LC) exists	-.108*** (.040)	-.102** (.048)	-.101*** (.036)	-.088** (.042)	-.107*** (.040)	-.100*** (.036)
LC exists x Tax Rate	.310*** (.120)	.299** (.144)	.281*** (.109)	.240* (.129)	.304** (.122)	.259** (.110)
BaWü-Dummy					-.054 (.035)	-.052 (.040)
BaWü x Tax Rate					-.024 (.064)	-.084 (.059)
Fixed Assets previous period		.485*** (.042)		.478*** (.037)		
ln (Gross Domestic Product GDP)	-.332 (.268)	.654 (.536)	-.342 (.247)	.505 (.498)	-.333 (.268)	-.343 (.247)
ln (GDP per Capita)	1.10*** (.266)	-.292 (.534)	1.07*** (.245)	-.137 (.494)	1.10*** (.266)	1.07*** (.245)
Profitability	-.050 (.038)	.075* (.042)	-.043 (.034)	.072* (.038)	-.050 (.038)	-.043 (.034)
Profitability previous period	.093*** (.029)	.191*** (.034)	.099*** (.027)	.187*** (.031)	.093*** (.029)	.099*** (.027)
Inflation Rate	-.071 (.064)	-.013 (.032)	-.028 (.021)	-.021 (.024)	-.071 (.064)	-.028 (.021)
OECD Country Risk	-.013 (.011)	-.007 (.012)	-.018* (.009)	-.009 (.010)	-.013 (.011)	-.018* (.009)
Currency Fluctuation	.054*** (.012)	.021* (.011)	.050*** (.011)	.023** (.010)	.054*** (.012)	.050*** (.011)
100% participation only	✓	✓			✓	
Majority participation only			✓	✓		✓
Direct participation only	✓	✓	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓	✓	✓
Observations	54.426	54.426	66.452	66.452	54.426	66.452
AR(1)-Test		.000		.000		
AR(2)-Test		.540		.562		

Dependent variable: ln (assets). The *Year Dummies* from 1997 to 2008 are included but not reported. Robust standard errors are in brackets. *, ** and *** point to significance of 10%, 5% and 1%. The numbers assigned to autocorrelation for the AR(1)- and AR(2)-Tests are p-values.

In Table 3-2 the overall tax rate effect is investigated. Firms' heterogeneity has largely been considered, since micro-data of individual corporations and not investment numbers aggregated into country or annual level have been used for the estimations. When investigating the tax rate effect on investment, it would be rather helpful to be able to isolate corporations that are either very strongly or not at all affected by the tax rate. The latter kind could theoretically be foreign subsidiaries that are granted a period free of taxation, a so called 'tax holiday'. The identification of such subsidiaries is difficult, since such incentives are currently mostly handled on an individual base. Such exemption from taxation should also

not be granted to too many subsidiaries. There is nonetheless another way through which corporations more or less affected by taxes can be identified. The tax rate is significantly less relevant for corporations with loss carryforwards. After all, they have the possibility to guard their profits from being taxed by using some or all losses carried forward from past periods.¹⁷ Table 3-3 shows the results of estimations that follow such a distributive approach.

The number of observations in Table 3-3 show that again all the subsidiaries are included in the estimations. The control variables match the ones in Table 3-2. The dependent variable is still represented by tangible and intangible assets. The newly added dummy variable *loss carryforward exists* is 1 if the subsidiary can transfer losses from the previous period. Otherwise it is zero. As anticipated, the effect is significantly negative, which means the subsidiaries with an existing loss carryforward invest around 10% more than those without. This could be because the parent corporation has reacted to its subsidiary's recent failings and is subsequently making less means for investment available. It could also be down to the subsidiary's internal financing's lack of investment means.¹⁸

The focus will now shift towards the newly introduced interaction term *LC exists x Tax Rate*. It records the extent to which the existence of a loss carryforward influences the tax elasticity of investment. It may be observed, at first glance, that as in Table 3-2 the single tax rate effect is negative and highly significant for all estimation procedures. The interaction term runs contrary to the tax rate effect. The coefficient of *LC exists x Tax Rate* is consistently positive and significant. The tax rate maintains its overall negative effect on firms with loss carryforwards. This effect, however, is significantly lower with such subsidiaries. About half of the negative tax rate effect is compensated in the presence of a loss carryforward. In column (1), the pure tax rate effect is -0.637 and the interaction term is 0.310. The sum of the effect hereby comes to merely -0.327. A by one percentage point increased tax rate will only lead to a 0.327% reduction of the parent corporation's investment into a subsidiary. The results in columns (2), (3) and (4) and those in column (1) are qualitatively roughly equivalent.

It is plausible for the existing loss carryforward to compensate the tax rate effect to a partial extent only. Firstly, the subsidiaries' loss carryforwards will eventually be used up. Secondly, some countries enforce a minimum taxation regulation. Hereby only partial netting out is

¹⁷ The effect of losses in the context of taxation has long been researched on a theoretical and an analytical level. See Altshuler und Auerbach (1990), Niemann (2004). In recent times the topic has found its way into the empirical literature. See Edgerton (2010) as well as Dreßler und Overesch (2010).

¹⁸ Since losses in the foreign subsidiary are isolated with regards to tax, those losses may generally not be accounted for by partners, nor with those partners in or outside the country. See Herzig (2005).

possible. Thirdly, loss carryforwards may expire due to temporal restrictions or any kind of restructuring. In columns (5) and (6) the BaWü dummy and its interaction with the tax rate is added. As seen in the first regression table, the manner in which Baden-Württemberg parent corporations invest in their subsidiaries does not systematically differ to that of the parent corporations in other federal states. The effort regarding the tax rate effect or the compensating impact of existing loss carryforwards are as a result also applicable to Baden-Württemberg firms. Very high detected volumes of unused loss carryforwards of German and foreign corporations suggest that this aspect is by no means an exotic or peripheral topic.¹⁹

The first two regression tables show the effect of corporate taxation on the level of investment, which is measured in fixed assets. Multinational corporations have the opportunity to decide on the amount of fixed assets as well as to structure their investments into different special forms. The amount invested is hereby of less importance. It is much more the way in which these investments are embedded in the corporation's network that is relevant. The third section of this empirical part focuses on such analyses of corporations' structures. An obvious example of such structures will be picked out and examined.

The assets considered above are primarily found in producing subsidiaries. The production site choice may be subject to various non-tax related arguments. Despite the fact that the implemented control variables largely control for the influence of such aspects, it would be interesting to analyze those firms that are chiefly driven by tax factors, as opposed to any other kind of influencing factors. Holding companies can be viewed as such a form of subsidiary. When establishing such a holding company, a corporation will be swayed especially by tax related arguments. In comparison, tax related arguments will carry much less weight in an argument over where to actually produce. In locations that are favorable from a tax point of view, the number of holding companies in proportion to all observed subsidiaries should be high.²⁰

¹⁹ In 2004 the German Ministry of Finance declared a loss allocation potential of over EUR 250 billion. See Müller-Gatermann (2004) p. 467.

²⁰ Heckemeyer and Spengel (2008) deliver an estimation of the extent of profit transfers of multinational corporations. Such transfer for tax reasons are sensible from production sites with a high tax rate to holding companies in a low tax rate location.

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Table 3-4: Low tax rate countries as preferred locations for holding companies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax Rate	-.037*** (.013)	-.031*** (.011)	-.055** (.023)	-.071*** (.021)	-.037*** (.013)	-.031*** (.011)	-.055** (.023)	-.070*** (.021)
Withholding Tax					-.080*** (.013)	-.090*** (.012)	.028 (.031)	.007 (.027)
ln (Gross Domestic Product GDP)	.013*** (.001)	.011*** (.001)	.012*** (.002)	.013*** (.001)	.013*** (.001)	.011*** (.001)	.012*** (.002)	.013*** (.001)
ln (GDP per Capita)	.002 (.002)	.006*** (.001)	-.002 (.003)	.002 (.002)	.002 (.002)	.007*** (.001)	-.002** (.003)	.002 (.002)
Profitability	-.010 (.006)	-.011** (.005)	-.018 (.011)	-.004 (.010)	-.010* (.006)	-.011** (.005)	-.017 (.011)	-.004 (.010)
Inflation Rate	.017 (.011)	.013* (.007)	.056*** (.021)	.048** (.019)	.019* (.011)	.016** (.007)	.054*** (.021)	.047** (.019)
OECD Country Risk	-.003** (.001)	-.002*** (.001)	-.003 (.002)	-.002 (.002)	-.002** (.001)	-.002** (.001)	-.003 (.002)	-.002 (.002)
Currency Fluctuation	-.003*** (.000)	-.002*** (.000)	-.002** (.001)	-.002*** (.001)	-.002*** (.000)	-.001*** (.000)	-.002*** (.001)	-.002*** (.001)
Exclusively BaWü			✓	✓			✓	✓
100% participation only	✓		✓		✓		✓	
Majority participation only		✓		✓		✓		✓
Direct participation only	✓	✓	✓	✓	✓	✓	✓	✓
Year Dummies	✓	✓	✓	✓	✓	✓	✓	✓
Observations	82.063	101.484	17.953	21.682	81.917	101.292	17.931	21.652

Dependent variable: Dummy for the existence (1) or non-existence (0) of a holding company. The Year Dummies from 1997 to 2008 are included but not reported. Robust standard errors are in brackets. *, ** and *** point to significance of 10%, 5% and 1%.

A detailed analysis would answer such a question with a counter variable model.²¹ Here, the basic linear estimation should be sufficient to show that the effect exists. The estimations of Table 3-4 are thus based on the standard method OLS.²² Dynamic estimations with a past parameter and instrumentation are not appropriate here, as it is not a growing set (like with the investment) that is being examined. It is for the same reason, that the estimations here are not (like in the first two tables) in first differences.

The dependent variable in Table 3-4 is a dummy which is one if the observed subsidiary is a holding company. It is zero if the subsidiary is a production company or a service company without a holding function. As can be seen from Table 3-4, the tax rate effect is negative and highly significant for all specifications. This means that in locations with a low tax rate the fraction of holding companies in relation to the number of subsidiaries is relatively high. The results confirm the hypothesis that when looking for a location for a holding company, low

²¹ See Winkelmann (2008) for a technical explanation of such counting variable models.

²² See Angrist und Pischke (2009) p. 25 ff. for the suitability of the standard OLS procedure for an approximate solution for such a question or for a general execution see v. Auer (2007) p. 13 ff.

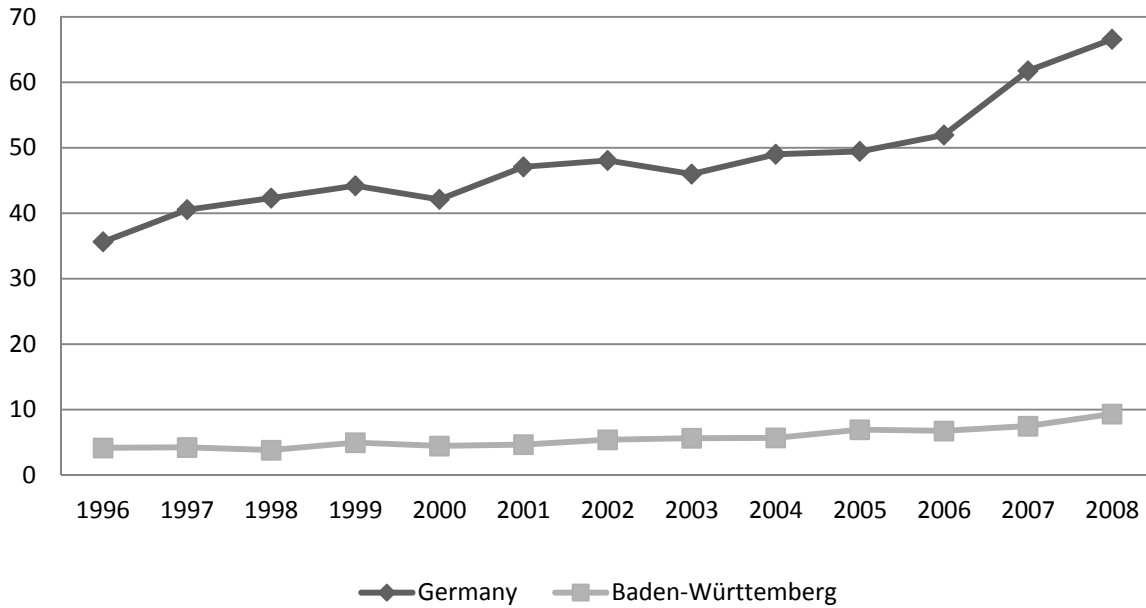
tax rates are particularly important. The coefficient of -0.031 in column (2) indicates that a corporate tax rate cut of one percentage point causes the share of holdings with all subsidiaries to increase by 0.031%. Across all estimations, a 10 percentage point tax rate drop brings about an increase in the share of holdings of about 0.5%. Despite being numerically small, this effect is nevertheless statistically significant. One must not forget that a corporate holding company can easily assemble dozens of production subsidiaries. This means that already one or a few holdings suffice for a group to set up a tax efficient structure.

The corporate tax rate will play a big role in any holding company location decision. Additionally, further taxes might play an essential role, once profits are repatriated home to the German parent corporation. This so called *withholding tax* is thus added in columns (5) to (8). Columns (5) and (6) show that a low withholding tax attracts holdings. This effect is considerably stronger than that of the corporate tax rate. A one percent increase in holdings (relative to all recorded subsidiaries in that country and year) is caused by a reduction in the withholding tax by 10 percentage points. In columns (7) and (8) this effect is no longer detectable. As mentioned earlier, these results are based on the significantly smaller Baden-Württemberg sample. As a result they are not particularly reliable. With regards to the overall tax rate effect, there is no systematic difference in the way companies from Baden-Württemberg and those from other federal states calculate and plan their structures. This observation falls in line with the above analysis.

3.2.2 Foreign corporations' investment in Germany

Section 2.1 looked at the tax rate effect on investments of German parent corporations in their foreign subsidiaries. This section will focus on the reverse. It will illuminate where and how foreign corporations are invested in Germany. Generally speaking, the effects taken from the earlier estimation results should also show up for investment into Germany – the so-called inbound investments. The descriptive structure is the mirror image of that of part 2.1. The estimations, however, will show that there is much less potential for identification with the inbound part. The reasons for this will be explained in that respective section. The econometric section of this part is less about gaining thematic results than demonstrating why empirical analyses under certain conditions may not be conclusive.

Figure 3-5: Inbound fixed assets in EUR billion



3.2.2.1 Investment development

The media likes to name and portray Germany as the ‘Export World Champion’. The products sold abroad measure is what is mostly to be meant with this. The comparison between Figure 3-5 and Figure 3-1 shows that the world champion title would also apply when looking at German companies’ assets. German companies are much more heavily invested abroad than foreign companies are invested in Germany. Figure 3-1 shows a range from EUR 120bn in 1996 to EUR 390 billion in 2008. Figure 3-5 shows that the foreign corporations’ assets in Germany have gone from only EUR 35.6 billion in 1996 to EUR 66.5 billion in 2008. The numbers have doubled in size for the whole of Germany. Baden-Württemberg has seen an increase by a factor of 2.27, from EUR 4.1 billion to EUR 9.3 billion.

The increased aggregated level of investment can be traced back to the enlarged average size and number of foreign companies’ subsidiaries in Germany. In 1996, there were 3,927 such subsidiaries in Germany. By 2008 that number had risen to 4,619. The average size of a subsidiary was EUR 9.1 billion in 1996 and EUR 14.4 billion by 2008. The number of subsidiaries has risen by only 17.7% compared to the 58% that they have increased in average size. The aggregated growth is therefore mainly caused by the latter effect.

3.2.2.2 Comparing investment in the different German federal states

Analogous to Figure 3-2 from the outbound investment part 2.1, Figure 3-6 shows in regular intervals for the years 1996, 2002 and 2008 what share of the investment by foreign companies goes to which federal state. As before, it is the fixed assets which are analyzed. The four large federal states Nordrhein-Westfalen, Baden-Württemberg, Hessen and Bayern share two thirds of the total amount of foreign assets between them. Figure 3-5 shows that investment into Baden-Württemberg has increased by more than that into Germany as a whole. As a result, Baden-Württemberg's share has increased from 12% in 1996 to 14% in 2008. The overall volume has gone from EUR 35.6 billion in 1996 to EUR 48.1 billion in 2002 to EUR 66.5 billion in 2008. Of this EUR 4.1 billion in 1996, EUR 5.4 billion in 2002 and EUR 9.3 billion in 2008 have gone to Baden-Württemberg.

Figure 3-6a: Inbound fixed assets 1996

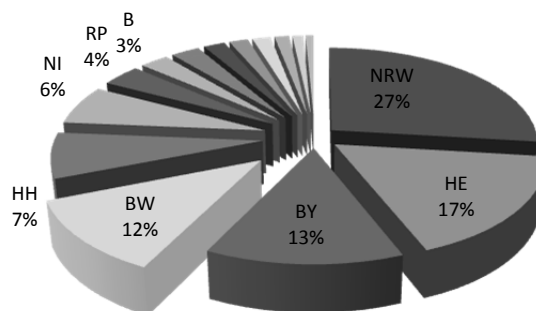


Figure 3-6b: Inbound fixed assets 2002

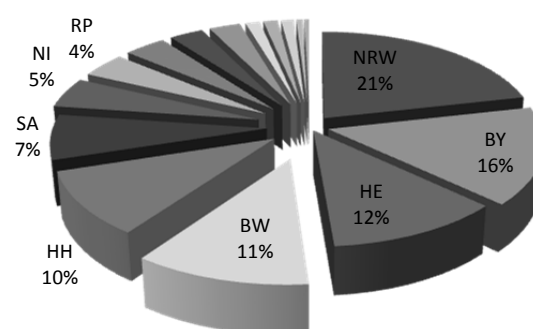
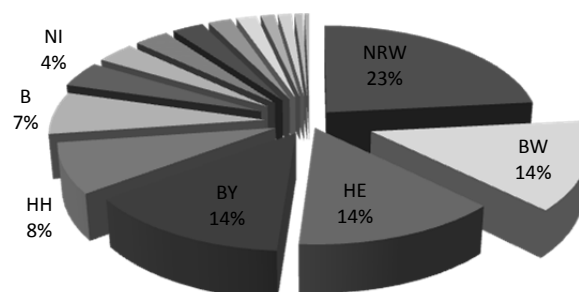


Figure 3-6c: Inbound fixed assets 2008



3.2.2.3 Corporate Tax development

The German corporate tax rate has been lowered in several steps throughout the thirteen year observation period. The tax-induced attractiveness of investing in Germany is identical for all foreign corporations. Figure 3-7 shows the corporate tax rate development: A reduction from 57.25% in 1996 to 30.95% in 2008. Solidarity surcharge as well as a uniform trade tax multiplier of 410% has been taken into account here. There is no differentiation according to trade tax, because putting federal city states and larger ones on the same level regarding average trade tax would result in misleading impressions.

Figure 3-7: Inbound fixed assets in EUR billion

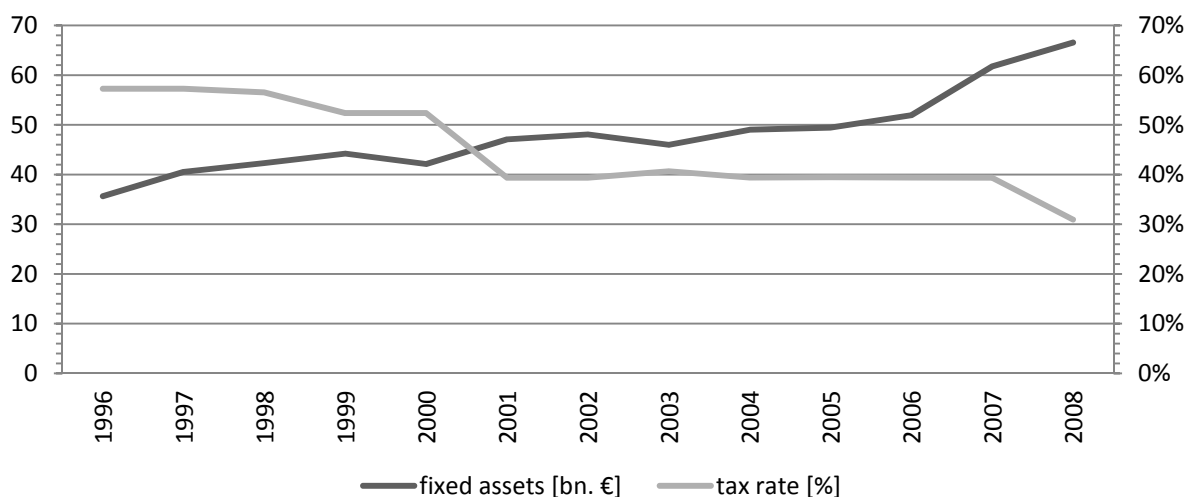


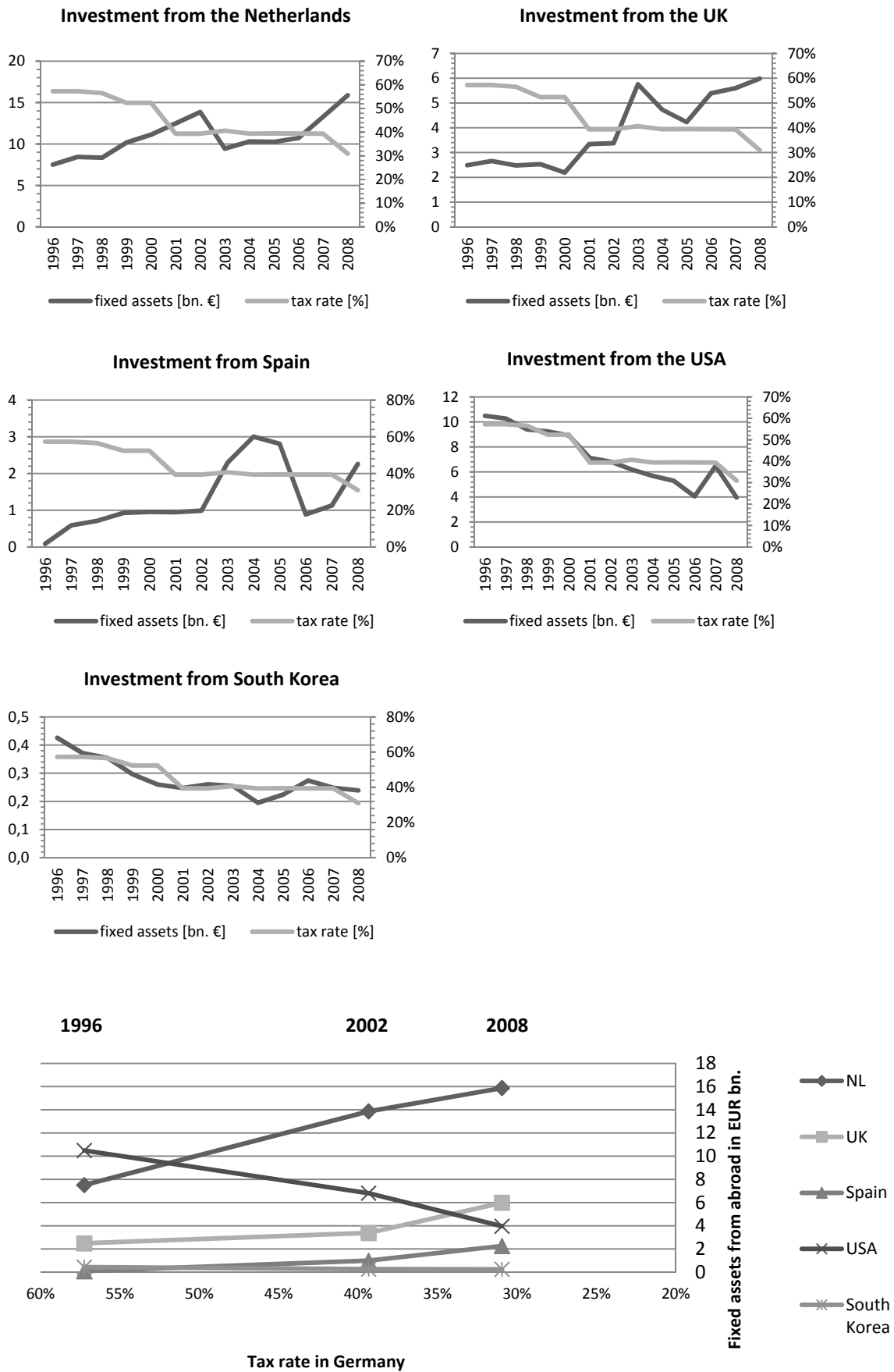
Figure 3-7 demonstrates that investment, as measured by assets held in Germany, has risen whilst the combined corporate tax rate has fallen. A tax rate effect on investment may not reliably be derived from this. If the tax rate in other countries has fallen by more than that in Germany, investors may have looked elsewhere out of tax concern. Investment may also have risen for completely tax-unrelated reasons. Analogous to the outbound observations aspects like GDP, firm profitability and inflation would have to be considered.

As mentioned above, all foreign corporations see the German tax rate development in the same way. This is why the diagrams in Figure 3-8 all have an identical tax rate development. Figure 3-8 shows the reduction in the German corporate tax burden on the investment development for five chosen countries.

Figure 3-8 shows that investment by foreign corporations has developed differently depending on in which foreign country the investing corporation is located. The Netherlands, Great Britain and Spain hold more assets in Germany in 2008 than they did in 1996.

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Figure 3-8: Inbound fixed assets on a per country basis in EUR billion



German assets held by US and South-Korean corporations have, on the other hand been receding. The different scaling is something to watch out for here. In 2008, US corporations hold EUR 3.7billion in German assets, whereas companies from Spain only hold EUR 3.1 billion. With EUR 6 billion, the investment coming from Great Britain exceeds that coming directly from the US.

It is worth pointing out that US corporations for example may execute their investments in Germany via an intermediary company based in a different country. Since this would have an effect on the statistic, the single country trends must not be overrated. On aggregate (refer to Figure 3-7) this aspect will not be visible.

The investment from the Netherlands, Great Britain and Spain suggest a possible positive correlation between a reduced tax rate and higher investment. Such, on the other hand, is not implied by the charts of the USA and South-Korea.

The last illustration of Figure 3-8 is a summary of all the diagrams in Figure 3-8. It provides an overview on the basis of a standardized scale. The decreasing investment directly from the USA is particularly prominent. In contrast, investment coming from the Netherlands has been growing significantly. As pointed out above, this could be down to US-corporations' increased tendency to use the Netherlands as a location for their intermediary companies as executors of their investment into Germany. If this is the case, then the two opposing effects would balance each other out. It is a well-known fact that the Netherlands are generally a popular holding company location (see Mintz und Weichenrieder, 2010). In order to hereby explain the trend, the attractiveness of such a structure would have to have increased dramatically over the years.

The German corporate tax rate for the years 1996, 2002 and 2008 is on the X-axis. An upward sloping straight line would suggest the expected indirectly proportional relationship between tax rate and investment. A downward sloping straight line, as in the USA case, would suggest a counterintuitive proportional relationship. An actual effect may not be derived from such a chart, since not all tax-unrelated influences are included.

3.2.2.4 Empirical investigation into the effect of tax on investment

The tax rate effect based on outbound investment has been proven in several estimations in section 2.1. This effect should also generally apply for inbound investment. Upon further deliberation it becomes clear, that a possibly existent tax rate effect on inbound investment cannot be proven via the estimation procedures outlined above. Becker, Fuest and

Hemmelgarn (2006) have attempted to prove this effect. They investigated the effect of the 2000 corporate tax reform, by looking at average values before and after the reform. A negative effect of tax on inbound investment is detected. The authors themselves point out that the magnitude of the identified effect is surprisingly large.

In the case of outbound investment, considerable variations are present. This is because during the same years the respective countries have different tax rates, which they change at different times and to varying extents. For the inbound case, only unitary features of Germany (e.g. the German tax rate) can be drawn upon. As a result, there is not such a large scope for explanation. When trying to evaluate the tax effect on investment, the inbound case lacks an alternative investment opportunity in one or more additional countries. The outbound case and its 51 possible destination countries provide such an investment opportunity. An evaluation of the effect using our model based on international variations is hardly possible for the inbound case, as it lacks comparable measures. An estimation for the inbound case promises little success, as insufficient variation regarding the tax rates and control variables persist. An estimation for the inbound part is for these reasons deliberately not presented here.

3.3 Summary and outlook

The paper shows empirically that corporate taxes have a negative effect on investment. It highlights particularly which conclusions can be drawn from what approaches. The descriptive charts on annual investment may serve as a first starting point only. Reliable proof concerning the sought-after tax effects may only be obtained by means of estimation procedures. Since estimations require a minimum amount of variation and different comparison groups, proving the tax rate effect on investment was only possible in the outbound case and not the inbound one.

The development of direct investment by German parent corporations abroad and that of foreign corporations in Germany from 1996 to 2008 has been examined. Especially the descriptive analysis has segmented inbound and outbound investments for the different federal states. The descriptive analysis shows the rapid growth of international investment activity in the observed period from 1996 to 2008. The development of Baden-Württemberg corporations has largely been the same as that of Germany as a whole. The empirical level also shows that Baden-Württemberg corporations' investment calculations do not significantly differ to those of corporations from the rest of Germany.

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The empirics exclusively focus on the outbound case. The estimations proceed in three different steps. The first step shows that the effect of corporate tax on the investment volume is negative. A by 10 percentage points increased (reduced) corporate tax rate causes a 5.32 percent reduction (increase) in investment, measured by fixed assets.

The second step provides the analysis of empirical evidence for the fact that companies with an existing loss carryforward are less concerned with tax rates in their investment decisions. About half of the negative tax rate effect is compensated for firms with an existing loss carryforward. If the pure tax rate effect is -0.553 and the interaction term of an existing loss carryforward and the tax rate is 0.299, the summated effect is merely -0.254. A tax rate increase of one percentage point therefore only leads to a reduction in investment by 0.254%.

The third step extends the empirical analysis into the research field concerned with corporations' structures. Especially holding companies are set up by multinational corporations in tax favorable destinations in order for investments to be able to be structured optimally regarding tax. Table 3-4 provides evidence for the idea that locations with a reasonably low corporate tax rate and low withholding taxes boast a relatively high number of holding companies. A decrease of ten percentage points in a country's corporate tax rate causes an increase in the share of holding companies in all subsidiaries in that location by 0.55%. The effect is even stronger regarding withholding taxes. A ten percentage point decrease in withholding taxes causes an increase of 0.80% of holding companies relative to all kinds of subsidiaries. The relationship between tax and corporations' structures is a field containing lots of future research questions. A more detailed competency in this field is relevant for tax policy, as it uncovers dodging reactions that are hidden from view when only investment numbers are looked at.

The inbound case looks at foreign parent corporations' investment into their subsidiaries in Germany. It shows why an analysis based on estimations would not deliver meaningful results in this subset. The reason for this is the lack of variation of the relevant variables necessary for such an approach. The detailed descriptive analysis already leads to the conclusion that cross border investment into Germany has increased throughout the observed time period.²³ A clear conclusion about whether this is because of the fallen corporate tax rate or other factors may not be drawn.

²³ Especially the 2008 corporate tax rate reform and its reduction of the corporate tax rate from 25% to 15% could have attracted investors. There are, however, critics who claim that this effect of the reform has only a small reductive effect on the tax burden. See Radulescu und Stimmelmayer (2008).

3.4 Literature

- Altshuler, R. and A.J. Auerbach (1990): The Significance of Tax Law Asymmetries: An Empirical Investigation, in: *Quarterly Journal of Economics* 1990, 61-89.
- Angrist, J. and J.S. Pischke (2009): Mostly Harmless Econometrics: An Empiricist's Companion, Princeton and Oxford 2009.
- Arellano, M. and S. Bond (1991): Some tests of specification for panel data: evidence and an application to employment equations, *Review of Economic Studies* 58, 277-297.
- Auer, L. and (2007): Ökonometrie, 4th edition, Berlin/Heidelberg 2007.
- Becker, J. and C. Fuest (2006): Ist Deutschland ein Hoch- oder Niedrigsteuerland? Der Versuch einer Synthese, *Perspektiven der Wirtschaftspolitik* 7, 35-42.
- Becker, J., Fuest, C. and T. Hemmelgarn (2006): Corporate Tax Reform and Foreign Direct Investment in Germany – Evidence from Firm-Level Data: Working Paper August 2006.
- Becker, J., Fuest, C. and C. Spengel (2006): Konzernsteuerquote und Investitionsverhalten, *Zeitschrift für betriebswirtschaftliche Forschung* 58, 730-742.
- Cameron, C. and P. Trivedi (2009): Microeconometrics using Stata, College Station, TX 2009.
- De Mooij, R.A. and S. Ederveen (2003): Taxation and foreign direct investment: a synthesis of empirical research, *International Tax and Public Finance* 10, 673-693.
- Devereux, M.P. and R. Griffith (2003): Evaluating Tax Policy for Location Decisions, *International Tax and Public Finance* 10, 107 - 126.
- Dreßler, D. and M. Overesch (2010): Investment Impact of Tax Loss Treatment – Empirical Insights from a Panel of Multinationals, ZEW Discussion Paper 10-097.
- Edgerton, J. (2010): Investment incentives and corporate tax asymmetries, *Journal of Public Economics* 94, 936-952.
- Elschner, C., J.H. Heckemeyer and C. Spengel (2011): Besteuerungsprinzipien und effektive Unternehmenssteuerbelastungen in der Europäischen Union: Regelt sich die EU-weite Steuerharmonisierung von selbst?, *Perspektiven der Wirtschaftspolitik* 12, 47-71.
- Feld, L. and J.H. Heckemeyer (2011): FDI and Taxation – A Meta Study, *Journal of Economic Surveys* 25, 233-272.
- Heckemeyer, J.H. and C. Spengel (2008): Ausmaß der Gewinnverlagerung multinationaler Unternehmen empirische Evidenz und Implikationen für die deutsche Steuerpolitik, *Perspektiven der Wirtschaftspolitik* 9, 37-61.
- Herzig, N. (2005): Verluste im Körperschaftsteuerrecht, in: Verluste im Steuerrecht, Groll, Rüdiger von (ed.), Deutsche Steuerjuristische Gesellschaft e. V., Volume 28, Cologne 2005, 185-203.
- Jacob, M., A. Pasedag and F.W. Wagner (2011): Werden niedrige Steuersätze in Osteuropa durch Verzicht auf Verlustverrechnung erkauf?, *Perspektiven der Wirtschaftspolitik* 12, 72-91.
- Keuschnigg, C. (2008): Exports, foreign direct investment, and the costs of corporate taxation, *International Tax and Public Finance* 15, 460-477.
- Mintz, J. and A. Weichenrieder (2010): The indirect side of direct investment – multinational company finance and taxation, Cambridge, MA 2010.
- Müller-Gatermann, G. (2004): Aktuelles zum Unternehmenssteuerrecht, *Die Wirtschaftsprüfung* 2004, 467-476.
- Niemann, R. (2004): Investitionswirkungen steuerlicher Verlustvorträge – Wie schädlich ist die Mindestbesteuerung?, *Zeitschrift für Betriebswirtschaft* 2004, 359-384.
- Radulescu, D.M. and M. Stimmelmayer (2008): Die Unternehmensteuerreform 2008: Eine Reformalternative für Deutschland?, *Perspektiven der Wirtschaftspolitik* 9, 19-36.
- Winkelmann, R. (2008): Econometric analysis of count data, Berlin and Heidelberg 2008.
- Wooldridge, J. M. (2008): Introductory Econometrics, 4th edition, Scarborough 2009.

3.5 Survey 1: Empirical Studies on the Effect of Corporate Income Taxes on Investment

Survey ²⁴	Data	Methodology	Results
An (2011)	Firm-level panel data from the Chinese industrial enterprises database (2002 till 2008).	Difference-in-differences approach to determine whether multinational enterprises reducing their investment in China due to the new corporate income tax law, applicable since January 1st, 2008. This law removed tax privileges of foreign investment enterprises compared to local investors.	Based on the tax law change, foreign investment enterprises indeed seem to relatively reduce their investment in China. The size effect is larger for Hong Kong-Macau-Taiwan investment enterprises than for other foreign investment enterprises, supporting the claim that some Chinese investors engaged in “round-tripping” FDI.
Azémar, Desbordes, Muchielli (2006)	OECD panel dataset including 26 developing countries for the period 1989–2000. The paper focuses on Japanese FDI flows.	Generalized least squares estimations and Baltagi’s error component two-stage least squares procedure; dependent variable: Japanese FDI Flows; independent variable: effective statutory tax rate.	There is a link between the Japanese tax sparing provision and FDI, suggesting that FDI flows in tax sparing countries are three times bigger than in non-tax sparing countries. The effective statutory tax rate and thus tax sparing provisions are a significant factor in the investors’ strategic location choice decisions.
Barrios, Huizinga, Laeven, Nicodème (2008)	Amadeus panel data on multinational firms operating in 33 European countries covering the years 1999 till 2003. The study builds on 26,567 firm observations.	OLS and conditional logit regressions. The dependent variable is the subsidiary location. Independent variables are the effective tax burden, the host country corporate tax, an international tax, the withholding tax, and the parent country corporate tax.	Parent-country (double) corporate taxation has an independent, strongly negative effect on the probability of foreign subsidiary location in potential host countries.
Becker, Egger, Merlo (2012)	Compiled national database of more than 11,000 municipalities in Germany from 2001 to 2005. This jurisdictional dataset is merged to firm data in form of the inbound side of the German Federal Bank’s Midi dataset.	Cross section model for count data, other cross section models and a fixed effects panel model. The dependent variables, applied one by one, are the number of foreign affiliates, the employees of foreign affiliates and the fixed assets of foreign affiliates. The important independent variables business tax and formula-apportioned business tax are instrumented.	Higher business tax rates have a negative effect on three alternative measures of multinational enterprises’ (MNE’s) activity, after controlling for other determinants of firm location decisions: the number of foreign MNEs, MNE employment, and MNE fixed assets.

²⁴ Some of the methodologies’ and results’ summaries quote the respective papers literally.

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Becker, Riedel (2012)	Amadeus financials database covering the years 1995 till 2005 and providing observations of firms located in 38 different countries.	Multinational firm activities at home and abroad might be positively correlated which may be due to the use of common inputs like marketing, patents, etc. Applying a general method of moments approach, the paper traces to what extent a cost shock at one location may lead to reduced activity in all other locations within the firm.	Confirmation of the main hypothesis that corporate taxation at the parent location not only reduces the parent's capital stock, but also lowers capital stocks at affiliates abroad. A 10 percentage point increase in corporate tax rates is associated with a 5.6% decrease in the affiliate's capital stock.
Bénassy-Quéré, Fontagné, Lahrière-Révil (2005)	Bilateral FDI flows among 11 OECD countries in the time span 1984 till 2000 (Eurostat Cronos). Reference to Devereux and Griffith for explanatory variables. The paper builds on 1,163 observations.	A gravity model is applied, using FDI flows as the dependent variable and tax differentials as well as effective tax rates as the crucial independent variables.	An asymmetry in the impact of tax differentials on FDI is identified. Lower tax rates in the recipient countries fail to significantly attract foreign investment while higher taxes tend to discourage new FDI inflows. Additionally, the impact of positive tax differentials varies with the double-taxation arrangement in operation in the capital-exporting countries. Narrow tax differentials just slightly discourage inward FDI from crediting countries. Large tax differentials however, produce proportionately more important FDI outflows. Such an asymmetry does not exist for FDI stemming from exempting countries as it reacts linearly to tax differentials.
Blonigen (2005)	Analysis of several recent empirical papers on the tax effect on FDI, but no meta regressions. In addition, the US sales abroad are descriptively shown, differentiating by industry and by destination.	Meta study on factors influencing FDI flows.	Broad general hypotheses such as taxes generally discourage FDI are not universally confirmed.
Blonigen, Davies, Head (2003)	Panel Data 1986-1994, taken from annual U.S. Department of Commerce statistics on sales of foreign affiliates	Modification of the model by Carr, Markusen and Maskus into an absolute value model where skill difference and GDP difference are specified as absolute values. OLS and	Regression yields highly significant coefficients for both variables having opposite signs to the CMM model outcomes. The effect of the absolute skill difference on the FDI stock is highly negative, while the

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	of American parent firms and on sales of U.S. affiliates of foreign parent firms.	Tobit regressions. The real FDI stock serves as the dependent variable. The crucial independent variables are the absolute skill difference and its interaction with the absolute GDP difference.	interaction term is positive.
Buettner, Ruf (2007)	Outbound set of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The years 1996 till 2003 are used.	The binary dependent variable distinguishes if a firm holds an investment in a specific country or not. Crucial independent variables are the market size, labor costs, as well as effective, statutory, and marginal tax rates.	Statutory tax rates, market size and labor costs have a significant impact on the location decision for German companies. The impact of marginal tax rates is not significant.
Buettner, Wamser (2009)	Outbound set of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The years 1996 till 2004 are used.	Empirical analysis of the impact of taxes other than profit taxes on both investment and location decisions of multinationals.	The results do not only refer to corporate income tax effects, but also to non-profit taxes such as property taxes, sales taxes and VAT, and import duties. All of these taxes show significant adverse effects on the level of FDI. However, most of the effects of non-profit taxes vanish once country-specific fixed effects are included.
Carr, Markusen, Maskus (2001)	Panel data set from 1986 till 1994, taken from annual U.S. Department of Commerce statistics on sales of foreign affiliates of American parent firms and on sales of U.S. affiliates of foreign parent firms.	Ordinary least squares, weighted least squares and Tobit estimations. The dependent variable is the U.S. outbound investment. Crucial independent variables are the GDP sum, GDP difference squared, skill difference, investment cost host, trade cost by the host, and trade cost by the parent.	Tests of the Knowledge Capital Model result in the following conclusions: Outward investment from source country to affiliates in a host country is increasing in the sum of their economic sizes, their similarity in size, the relative skilled-labor abundance of the parent nation, and the interaction between size and relative endowment differences.
De Mooij, Ederveen (2003)	25 empirical studies from the years 1984 to 2001 dealing with the tax impact on foreign direct investment.	Meta study on the impact of corporate income taxes on foreign direct investment (FDI).	The study finds substantial variation among studies concerning the elasticity of foreign capital. Systematically lower absolute elasticities can be found in studies using data on the number of foreign locations as compared to studies using data on foreign capital. Studies using M&A data (as compared to aggregate FDI data) report smaller elasticities, while those using data on greenfield investments and expansions yield higher elasticities. Additionally,

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			effective or average tax rates seem to affect FDI more than statutory tax rates. The study cannot find support for the claim that investments from tax credit countries are less responsive to taxes than investments from tax exemption countries.
Desai, Foley, Hines (2004)	BEA panel data set for the years 1982, 1989, 1994. Covers U.S. based foreign operations.	Dependent variable: Log of assets, Log of gross product, Employee compensation/assets, Net Income/owner's equity; Independent variables: Income Tax Rate, Indirect Tax Rate	High direct and indirect taxes reduce FDI. High income taxes result in companies substituting labor by capital and reducing taxable income.
Dharmapala, Foley, Forbes (2010)	Confidential Bureau of Economic Analysis panel data set on U.S. based multinational enterprises from 1996-2005; BEA Survey of U.S. Direct Investment Abroad; Compustat and ExecuComp	Two-stage least squares instrumental variable approach. The tested dependent variables are capital expenditures, domestic employment compensation, R&D expenditures, parent leverage, firm expansion, CEO compensation, dividends to shareholders, and share repurchases. Independent variables are generally applied as lagged values. Repatriations are instrumented for, in order to overcome endogeneity issues and a general omitted variable bias.	U.S. companies were not financially constrained at the time of the Homeland Investment Act (HIA) that allowed for a repatriation of profits stored abroad at a reduced tax rate. The availability of cheaper internal financing after repatriation under HIA did not achieve its goal to boost investment, employment or R&D in the U.S.. Companies seem to have used the money for share repurchases.
Dwenger, Steiner (2012)	Construction of a pseudo panel for the years 1998-2004 by using the corporate income tax statistics and micro data provided by the Federal and State Statistical Offices.	Estimation of the average corporate tax rate's effect on corporate taxable income. The endogeneity of the tax rate is controlled for by applying an instrumental variables approach which calculates the microsimulation-based counterfactual average tax rate a corporation would have faced in a particular period had there been no endogenous change in corporate profits. The instrumental variables approach is reflected in 2SLS estimations.	The empirical results suggest that a reduction in the statutory corporate tax rate would reduce corporate tax receipts less than proportionally. The tax base elasticity of approximately -0.5 , implies that a reduction of the statutory corporate tax rate by 10 percent would reduce corporate tax receipts by roughly 5 percent.

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Edmiston, Mudd, Valev (2003):	Transition Report, EBRD, for the years 1993-1998.	Dependent variable: Annual inflows of FDI as percent of GDP; independent variables: Number of special tax rates, Number of lines in tax base description, Ambiguous language in tax law, Number of changes in tax parameters, Number of changes in opposing direction.	Complexity of tax codes might have had a negative impact on business activity in the transition economies. However, complexity alone is not a sufficient enough explanation. The overall uncertainty as well as the uncertainty of how to interpret the tax law is also an important factor.
Feld, Heckemeyer (2011)	Meta study based on 704 estimates derived from 45 studies altogether. 29 of these 45 studies have been covered in previous meta studies by De Mooij and Ederveen, whereas 16 are regarded for the first time.	Classical quantitative meta-analysis applying pooled OLS regressions and two forms of pooled weighted least squares regressions, namely fixed effects meta regressions and mixed effects meta regressions. The results are presented with and without publication bias correction one by one.	In absolute terms, the median tax semi-elasticity of FDI based on 704 primary estimates is 2.49 and the precision weighted average of the full sample of semi-elasticities is 2.55. Furthermore, there seems to be a publication bias in the primary literature and studies based on aggregate data report systematically larger semi-elasticities than firm-level analyses.
Galindo, Pombo (2011)	Firm level data from a set of 42 developing countries taken from the World Bank business environment surveys, covering the years 2004 till 2006.	OLS estimations with the dependent variables firm level investment and total factor productivity applied one by one.	Based on the results, investment and productivity respond negatively to an increase in the corporate tax rate. These effects are stronger in bigger firms. A one standard deviation increase in the corporate tax rate (0.10) would reduce investment for large firms in 0.0165, which is close to 15% of the sample average. A one standard deviation increase in the corporate tax rate would reduce the total factor productivity in 0.8, which is equal to nearly 35% of the sample average.
Grubert, Altshuler (2006)	U.S. Statistics of Income for 2002. Linked Forms 1120, 1118, and 5471 Treasury tax files. 752 observations	OLS regressions; Dependent Variable: CFC Dividends / Sales; independent variable: CFC Earnings / Sales; OLS Regression	Dividend exemption offers an efficiency gain through eliminating the need to avoid repatriations and the costs they entail. Furthermore, it does not increase the attractiveness of low-tax locations compared to current law. Burden-neutral worldwide option (Credit method with a lower tax rate of 28%) promises broader benefits. In particular, for most companies it will eliminate incentives for locating income in low-tax locations.

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Hines (1994)	Data on the aggregate behavior of all US firms in 1984, as reported by Bradford (1990)	Dependent variable: log interest/dividends; Independent variable: average foreign tax rate	A credit system being implemented by the home country of the parent company encourages that company to finance new investments abroad with a considerable amount of debt and restricts their equity stakes in affiliates. This incentive even remains when effective transfer pricing regulations are in place.
Hines (1996)	Bureau of Economic Analysis survey on U.S. Direct Investment Abroad 1987	Dependent variables: state share of PPE, state share of total affiliates; Independent variable: state tax rate (state tax rate for countries exempting income and zero for countries crediting it)	High state tax rates have a significantly negative effect on local investment. Investors who cannot claim credits for state tax payments reduce their investment shares relative to foreign tax-credit investors.
Louie, Russlang (2007)	U.S. Statistics of Income data on activities of U.S. companies for 1992, 1994, 1996.	Dependent variable: after-tax rate of return from the foreign subsidiary; Independent variables: host country statutory tax rate, double tax treaty, corruption	Poor host country governance increases the required pre-tax rate of return of U.S. companies on FDI. This added return reflects the cost of non-deductible bribes as well as a premium for the increasing uncertainty.
OECD (2008)	The meta study is based on 427 tax elasticities taken from empirical papers of a twenty year period between 1985 and 2005.	Meta study building on a literature review of De Mooij and Ederveen (2005) and including the information from further empirical papers dealing with the tax effects on FDI. The meta study compares time-series data studies, panel data studies and discrete choice models.	Overview and evaluation of existing literature by 2008. Calculated average and marginal effective tax rates for FDI under alternative financing structures and tax-planning strategies. The average semi-elasticity of the tax effect on FDI for discrete choice models (-3.43) is larger than that found for studies using panel data (-2.73) and time-series data (-2.61).
Ruf, Weichenrieder (2011)	Outbound set of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank.	Based on a rich panel data set of multinationals headquartered in Germany, the impact of an applicable German CFC legislation on the stock of passive assets held abroad is estimated.	The paper provides empirical evidence for the effectiveness of CFC rules. While a lower local tax rate in general attracts German passive investment, this effect is lower for countries for which the German CFC rule is applicable, since their local rate is below the safe-haven rate.

4. Investment Impact of Tax Loss Treatment

- Empirical Insights from a Panel of Multinationals^{25 26}

Abstract: I analyze the impact of tax loss treatment on multinational investment. Basically, two effects of tax loss treatment can be expected. First, firms make their investment decisions considering potential future losses. Then, the various types of conceivable loss offset provisions affect investment decisions. Secondly, existing loss carryforwards resulting from losses in the past affect the tax rate elasticity of current investment decisions. My empirical analysis is based on data of German multinationals. I pay particular attention to industries having a high probability to make losses. My regression results suggest that a short carryforward time limit lowers investment in particular for firms with a high loss probability. I only find mixed evidence that group loss offsetting provisions foster investment. Concerning the effects of existing losses carried forward, I find a reduced tax rate elasticity of investment for companies shielded by loss carryforwards.

Keywords: Corporate Taxation, Loss Treatment, Group Taxation, Multinational Firms, Empirical Analysis

JEL Classification: F23, H25, H32

²⁵ This paper is joint work with Professor Dr. Michael Overesch. On June 19, 2012, it has been published online in International Tax and Public Finance with the print version being forthcoming. A previous version of the paper has been published as ZEW Discussion Paper 10-097. In 2010, the paper has been presented at the 66th Congress of the International Institute of Public Finance (IIPF) in Uppsala, at an Empirical Tax Research conference in Mannheim, at a doctoral seminar in Karlsruhe, at the German Federal Bank's MiDi workshop in Frankfurt. In 2011, it has been presented in a seminar at the Università degli Studi di Brescia and at the VHB annual meeting in Kaiserslautern.

²⁶ I thank Dhammika Dharmapala, two anonymous referees, seminar participants at the University of Brescia and participants of the VHB conference 2011 in Kaiserslautern, the IIPF conference 2010 in Uppsala and the MiDi-Workshop 2010 in Frankfurt for helpful comments. I would like to thank the Deutsche Bundesbank for granting access to the MiDi database. Financial support by the German Science Foundation (DFG) is gratefully acknowledged.

4.1 Introduction

Losses gain increased attention in times of economic crises. In such situations, countries support their banks and industrial enterprises. Grants are provided in the assumption that, in the middle and long run, the respective company will recover and be able to repay the support. This is public interference in the face of private losses. What appears to be new has in fact traditionally been embedded in the tax system of many states. By granting ample tax credits or reimbursing previously paid taxes for suffered losses, the state exerts an insurance function. Income taxation can therefore serve as a kind of automatic stabilizer (Devereux and Fuest, 2009; Buettner and Fuest, 2010). In this paper, I analyze the investment effects of tax loss treatment from the perspective of the potential beneficiary: the private company.

While profits are taxed, no immediate tax refund is granted if a corporation suffers losses. Losses can only be used to offset profits generated in other periods or by affiliated companies. The tax loss offset rules, however, significantly differ between countries. Almost all countries offer the opportunity to carry losses forward to subsequent periods. Across countries, the time span for a loss carryforward varies between two years and indefinitely. Moreover, only a few countries grant a loss carryback. Besides offering the possibility to shift losses along the time dimension, some countries also allow the offset of profits and losses among companies belonging to the same group.

Interestingly, there is an overall tendency of relaxing the loss offset provisions during the last decades although many countries cut their corporate tax and compensate revenue effects by base broadening. While in 1996 32 out of 41 considered countries restricted the loss carryforward, in 2008 only 25 countries did so. The same holds true for the group taxation regimes which were granted in only 19 out of the 41 countries in 1996 but in 24 countries in 2008. Recently, the European Commission (2011) published its proposal for a Common Consolidated Corporate Tax Base (CCCTB) and named the netting of profits and losses between affiliated firms as one of the major goals to be reached.

I aim to analyze whether multinational firms structure their investments based on tax loss treatment rules. The different loss offset provisions, different probabilities to suffer losses and profit histories provide considerable variation for an empirical study. Multinational companies face different tax loss offset rules. In this study I ask whether the tax loss treatment in the host country exerts an impact on investment decisions of subsidiaries. I analyze this question for two scenarios, regarding the investment impact of *potential* losses and of *present* loss carryforwards. First, I focus on investment decisions in the general perception of

potential future losses. Second, I analyze how subsidiaries react once they have already suffered losses and decide in the presence of loss carryforwards. The policy implications might differ depending on which of the two strands is covered. On the one hand, a favorable tax loss treatment is expected to encourage multinational firms to invest more in the respective country. On the other hand, the setup of loss treatment rules affects competition, given that firms are in different positions due to their respective loss history.

The first part of the empirical analysis deals with investment aspects in sight of potential future losses. Analytical papers like Majd and Myers (1987) and Donnelly and Young (2002) suggest detrimental investment effects of partial tax loss refund regimes. My empirical analysis is based on a rich firm level dataset of German multinationals provided by the German Central Bank (*Deutsche Bundesbank*). The data enables me to use cross-country and temporal variation of tax loss treatment rules of 41 host countries spanning from 1996 until 2008. Moreover, the data provides additional firm variation and I make use of the fact that the likelihood of suffering losses differs across industries. Auerbach and Poterba (1987) and Altshuler et al. (2008) reveal asymmetric distributions of losses across industries. Yet, I am the first to use the industry information as a proxy for the probability to make losses in the future and, at the same time, as an indicator for how much attention is devoted to the tax treatment of such potential future losses.

I find some evidence indicating that in industries with a high probability to face losses firms indeed consider the tax loss treatment rules when making investment decisions. Regarding the loss offset among affiliated companies, my results are generally mixed. Only in some specifications, results suggest that the absence of a group taxation rule exerts a negative influence on investments for firms with a relatively high probability to face losses. Moreover, I consider the possibility of a loss carryback or the limitation of a loss carryforward. While I am unable to find significant effects of a loss carryback, in most specifications I find a significant influence of a strict loss carryforward limit if I consider the variation in probability to suffer losses among different industries.

Previous empirical evidence on the investment effects of tax loss treatment is still scarce. However, my analysis is related to a study by Devereux, Keen and Schiantarelli (1994), who trace the effects of restrictions on intertemporal loss offsetting using a panel of UK companies. They conclude from their empirical results that including tax law asymmetries does not improve the predictive power of a model to explain investment decisions. Unlike Devereux, Keen and Schiantarelli (1994), I find some investment effects of tax loss treatment

rules. My results might differ because I consider multinational firms which can reallocate investment funds as a response to tax loss treatment rules. Moreover, I can make use of additional variation due to the international variation in tax loss treatment rules and the industry variation in loss probabilities.

In the second part of my analysis, I provide evidence on the impact of a present loss carryforward. As shown by Auerbach (1986), tax effects oppose the negative liquidity and signaling effects of an existing loss carryforward. Taking into account that future profits could effectively remain free of tax, existing losses should reduce the tax elasticity of investment. Based on a small panel of UK firms, Devereux (1989) shows a negative investment effect of a refined measure for the cost of capital which considers losses carried forward. I provide direct evidence that an existing loss carryforward reduces investment. Moreover, my results suggest that the tax rate elasticity of investment is significantly reduced if a subsidiary can offset current taxable profits with losses carried forward from previous periods.

My analysis relates to a recent study by Edgerton (2010) who provides empirical insights into the interaction between a firm's taxable status and its response to tax incentives. Considering Compustat data of US and Canadian firms, he finds no significant cut in the response to taxes when he also controls variation in cash flow stocks. Interestingly, my results for subsidiaries of multinational firms suggest that the positive effect of an existing loss carryforward on the tax elasticity of investment prevails even if I include measures approximating cash flows such as sales or profitability. However, the firms considered by the two studies are very distinct which might explain the different findings regarding the impact of tax statuses. While Edgerton (2010) uses a sample of mainly domestic US and Canadian firms excluding almost all subsidiaries, I focus exclusively on subsidiaries of multinational firms. Investment decisions of subsidiaries might be less constrained by cash flow because they can benefit from the internal capital market of the multinational firm.

The rest of the paper is organized as follows. In the following section I discuss the effects of tax loss treatment on investments and derive empirically testable hypotheses. In Section 3, the empirical approach is presented. In Section 4, I describe my data. Section 5 provides regression results concerning the impact of tax loss treatment on investment behavior of firms which will potentially face losses. Section 6 presents empirical results on the effects of existing loss carryforwards. Finally, Section 7 concludes.

4.2 Investment Impact of Tax Loss Treatment

Basically, two effects of tax loss treatment can be distinguished. On the one hand, firms make their investment decisions facing potential future losses. Then, the various types of conceivable loss offset provisions should affect investment decisions. On the other hand, existing loss carryforwards resulting from losses in the past should affect the tax rate elasticity of current investment decisions.

4.2.1 Potential Losses

If a company expects losses in the future, the loss treatment for tax purposes should affect the investment decision. Thus, it is not the subsidiary's tax status that matters at the point of the investment decision, but the country's tax regulations applicable to all companies and the firm's expectations to suffer losses at some point. Whenever a general full loss offset is denied, profits and losses are treated asymmetrically from a tax point of view. Theoretical implications of such asymmetries in tax loss treatment have been shown by Majd and Myers (1987) and Niemann (2008) for intertemporal loss offsets and by Donnelly and Young (2002) regarding the netting of losses within groups. All these studies find a detrimental effect on investment caused by unfavorable tax loss treatment; only the degree of the impact varies depending on which particular rule is regarded. Cooper and Knittel (2006, 2010) show a significant decline in the real value of tax losses of US firms due to the penalty from partial loss refund regimes.

The aspect of risk plays an important role when considering the relationship between taxation and investment. Early analytical literature on risk-taking, such as Mossin (1968) or Mintz (1981), found fairly clear predictions in a full loss offset scenario. In such a scenario, the corporate tax might either leave investment choices unchanged or even encourage investment into risky projects. In the real world, however, I observe partial loss offsets with different degrees of tightness. This is also looked at in some more contemporary analytical models: MacKie-Mason (1990) stresses the potential benefits of nonlinear elements in the tax system, while Eeckhoudt et al. (1997) point at supposed detrimental aspects.

The tax loss treatment differs between countries. While in almost all countries losses can be carried forward to subsequent fiscal years, only a few countries allow a loss carryback. While the fundamental paper by Domar and Musgrave (1944) discusses the loss offset provision in a rather general way, Barlev and Levy (1975) distinguish between the carryforward and the carryback provision. They show that the expiration of a loss carryforward essentially depends

as much on the size of the loss suffered as on the sequence of consecutive profits and losses. They conclude from their analysis that a loss carryback provision is very valuable for increasing the probability of a successful offset whereas the difference in effect between a limited and an unlimited loss carryforward is negligible.

A loss carryback results in an immediate tax refund. Moreover, the past company results are well known. Therefore, a loss carryback option should have an even stronger influence on the investment decision than an option to net profits and losses sometime in the future. Still, a carryback option effectively leads to tax refunds only if the subsidiary has been profitable in the past. It seems reasonable to suppose that the relevance of tax loss treatment differs among firms. I assume materialized losses to indicate that in the respective industry the general possibility of suffering losses is considered more strongly. Tax loss offsetting rules might be particularly important for firms having a high probability to suffer losses in some years. Taking into account the reasoning and findings by Auerbach and Poterba (1987), Altshuler et al. (2008) and Cooper and Knittel (2010), I expect especially negative investment effects of restrictive tax loss treatment rules on firms engaged in very cyclical industries. Based on these considerations, I set up the following hypothesis:

H4-1: The absence of a loss carryback option should hinder investment because the tax refund serves as an insurance against part of the losses that are potentially to be suffered. The denied carryback option should particularly lower investment of firms that have a high probability to make losses.

As mentioned above, only a few countries offer a loss carryback, but all analyzed countries allow a carryforward of losses. Some countries, however, limit the maximum time span within which losses can be carried forward. The shorter the maximum time span which is provided for such intertemporal shifts, the higher is the probability of a limitation to offset the losses. It can be expected that companies invest less in countries where the time span that potential losses can be carried forward for is limited. Once again, this consideration should particularly prevail for companies anticipating a high probability of suffering losses. Concerning the limitations of a loss carryforward, I set up the following hypothesis:

H4-2: A smaller maximum number of years until the expiry of a loss carryforward should exert a detrimental effect on investment. The impact of limitations of a loss carryforward should be more pronounced for firms having a high probability of making losses.

Loss offsetting along the time dimension is relevant when a single subsidiary is analyzed in isolation. If, however, a parent company has more than one subsidiary, an offset among these different tax subjects might be attainable. The major requirement for such an offset is a group taxation regime that allows for consolidation of profits and losses between affiliated companies. Different kinds of group taxation regimes, such as group consolidation, group loss transfer or consortium relief, can be observed.²⁷ Despite differences in the respective setup, all these group taxation regimes enable the netting of profits and losses among group members. Donnelly and Young (2002) explain how the intragroup transfer of corporate business losses works and how strongly it affects groups' tax bases. If a group taxation regime is in place, the probability of a loss forfeit is considered to be lower. This mitigates the need for profits earned by the loss making subsidiary itself to offset the loss. A group taxation regime offers an additional opportunity to offset the loss and reduce the overall tax bill. Compared to a loss carryforward option, the group taxation regime offers the possibility to offset losses immediately. Moreover, since Cooper and Knittel (2006, 2010) find that in some industries losses carried forward can be very persistent, the absence of a group tax regime should hinder investment. These considerations lead to the following hypothesis:

H4-3: The absence of a group tax regime should hinder investment. The negative investment effect of an absent group taxation regime should be more pronounced for firms with a high probability of making losses.

4.2.2 Existing Loss Carryforwards

The tax treatment of losses should also affect investment decisions if a firm *already* has suffered losses and thus has a loss carryforward. Auerbach (1986) analyzes the effects of tax law asymmetries and derives two opposing effects of a loss carryforward on investment. On the one hand, a company showing a loss carryforward has suffered losses in the past. This fact could have a detrimental effect on investment levels because the subsidiary might lack internal financing. Moreover, in the case of multinational firms, local managers have difficulties to run for capital provided by the parent company because losses signal that the business model of the subsidiary is not very successful.

²⁷ In a consolidation system, the financial statements of companies belonging to the same group are either made up together or merged at the end of the fiscal year. When there is a system of group contribution, the profitable subsidiary is allowed to contribute a part or all of its profits to the subsidiary which suffered a loss. Correspondingly, losses are transferred among subsidiaries in a group relief system. In effect, all of these three systems enable the netting of profits and losses of different tax subjects.

H4-4: *The effect of a loss carryforward on the investment level should be negative if liquidity or signaling effects prevail.*

On the other hand, Auerbach (1986) also derives a tax effect of an existing loss carryforward. If a firm has a loss carryforward, returns on investment can be credited against the losses carried forward. Thus, a firm with a loss carryforward is supposed to be tax exempt to a certain extent. If I only consider the present and possible future status of a company and disregard the past, then the firm with a loss carryforward is supposed to invest more than a firm without the opportunity to reduce its future tax base. Given that there are sufficient funds to invest, this should result in an investment exceeding the one in a world without taxation or with a perfect loss offset.

The tax benefit of a loss carryforward is, of course, related to the level of the corporate tax rate. If a company has a loss carryforward, it simply does not have to pay the entire profit tax. While previous studies find negative effects of the corporate tax rate on investment decisions of multinational firms (for a survey, see De Mooij and Ederveen, 2003), this general relationship should be alleviated once losses are present. In the presence of a loss carryforward, the tax rate elasticity of investment should be lower in absolute value due to the fact that the company can net its carryforward against future profits, which then effectively stay untaxed (Creedy and Gemmel, 2008).

Cooper and Knittel (2006) state that, in the case of a persistent loss carryforward, a firm faces a decline in the marginal tax rate to zero. While a loss carryforward is often associated with a reduction of marginal tax rates, this is not always the case. The tax shield of a loss carryforward can also offset accelerated depreciation or interest deductions. Then, for some firms, the adverse effect of a loss carryforward on marginal tax rates might be less pronounced.²⁸ Still, I generally expect an adverse impact on the tax rate elasticity of investment. Therefore, I set up the following testable hypothesis:

H4-5: *An existing loss carryforward should reduce the tax rate elasticity of investment decisions.*

²⁸ I can also suppose very specific cases where a loss carryforward is associated with less investment. If, for example, the accelerated depreciation is offset by a loss carryforward and losses or depreciation cannot be carried forward to subsequent periods, the attractiveness of investment in fixed assets might be lost.

4.3 Empirical Approach

For the empirical analysis of the hypotheses set up in Section 2, I use firm level data of multinational subsidiaries. As the dependent variable, I consider the balance sheet item fixed assets of subsidiary i in year t . Moreover, I consider the statutory tax rate, a vector of non-tax controls X , a subsidiary-specific effect δ_i and a year effect γ_t . Then, I estimate equations of the following type:

$$\ln(\text{Fixed Assets})_{i,t} = \beta_0 + \beta_1 \text{TaxRate}_t + X_{i,t} \beta_2 + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (4-1)$$

I eliminate subsidiary-specific heterogeneity by taking first differences. Thus, subsidiary fixed effects are purged out by subtracting the lagged value of each variable (cf. Wooldridge, 2002). Then, the transformed equation is estimated by ordinary least squares (OLS).

In additional regressions, I take into account the persistence of the fixed assets by using a dynamic model which captures adjustment costs (Chirinko, 1993). In this sense, the approach reflects the marginal decision of the firm in terms of the scale of investment conditional on the chosen location. In the dynamic setup, I estimate equations of the following type:

$$\ln(\text{Fixed Assets})_{i,t} = \beta_0 + \beta_1 \ln(\text{Fixed Assets})_{i,t-1} + \beta_2 \text{TaxRate}_t + X_{i,t} \beta_3 + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (4-2)$$

Again, subsidiary-specific heterogeneity is removed by taking first differences. Yet, such a specification requires considering that my time-series information is not sufficient to avoid what is called a dynamic panel bias (Nickell, 1981). I use an instrumental variable (IV) estimator suggested by Anderson and Hsiao (1982) and apply simple two-stage least squares (2SLS) estimations where the second lagged level of the dependent variable $y_{i,t-2}$ is used as the additional instrumental variable excluded from the second stage regression.

In order to analyse the impact of tax loss treatment rules, I include dummy variables which indicate whether no group taxation regime or no loss carryback option is available or if the loss carryforward is limited in the respective host country. Additionally, I consider information on the relevance of these tax loss treatment rules. Yet, a firm-specific measure of the probability to face a loss might be endogenous because current investment activities of a subsidiary can impact future profitability. Therefore, I refer to industry-specific information to proxy the loss probability. I consider the loss probability measured by the ratio of loss making companies per year in industry k . Interaction terms between the loss ratio of the industry and the indicator variables for the tax loss provisions are key to the identification. The coefficients of these interaction terms show whether the effects of the tax loss treatment

rules are more pronounced for subsidiaries which are supposed to have a higher probability of suffering losses. Thus, negative signs are expected for the interaction effects.

In the second part of the empirical analysis, I focus on the impact of existing losses carried forward. I consider a binary variable indicating whether a subsidiary has an existing loss carryforward. Moreover, I construct interaction terms between this indicator variable and the corporate tax rate. While the general effect of the statutory tax rate is expected to be negative, an adverse effect is expected for the interaction term because a loss carryforward can be used to shield future profits from taxation.

4.4 Data and Descriptive Statistics

The empirical analysis uses the *MiDi* database for multinationals which is provided by the German Central Bank (*Deutsche Bundesbank*). The micro database covers information on both direct investment positions held in Germany by foreign companies and direct investment positions of German enterprises held abroad. The data allows me to trace multinationals and their subsidiaries over time. Panel data is currently available for the period from 1996 to 2008. In this study, I only analyze subsidiaries which are located outside Germany and are owned by a group with its headquarters in Germany.²⁹ Subsidiaries from the financial industry are excluded. I consider a sample of German subsidiaries located in 41 countries. This consists of the four BRIC countries, 29 countries which were members of the OECD in 2008, and the eight EU member states which were not OECD countries.³⁰ My sample consists of 59,917 observations of 11,727 subsidiaries belonging to 4,455 German parent companies.

The data collection is imposed by German law which requires reporting for certain international transactions and positions.³¹ This aspect of *MiDi* is worth emphasizing as I am thus able to observe virtually all major German outbound investments. Well-known multi-country datasets like Bureau van Dijk's Amadeus or Standard & Poor's Compustat Global

²⁹ I exclude observations from mining, agriculture, non-profit and membership organizations because special tax regimes may be available. Furthermore, I exclude observations of companies whose German parent is not an incorporated and legally independent entity as well as subsidiaries which are not legally independent.

³⁰ The BRIC countries are Brazil, Russia, India and China. The covered OECD countries in 2007 are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States. The additional EU countries are Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Slovenia and Romania.

³¹ Sec. 26 of Foreign Trade and Payments Act (*Aussenwirtschaftsgesetz*) in connection with Foreign Trade and Payments Regulation (*Aussenwirtschaftsverordnung*). Since 2002, FDI has to be reported if the participation is 10% or more and the balance-sheet total of the respective foreign investment in Germany exceeds EUR 3 million. For details, see Lipponer (2008). Although previous years showed lower threshold levels, I apply this one uniformly for all years in the panel. For general interpretations of the dataset from a tax and finance perspective, see Mintz and Weichenrieder (2010).

show leaks, especially for unconsolidated financial statements of small or middle-sized subsidiaries due to poor public disclosure requirements.

In all my regressions, I consider majority-owned and directly-held subsidiaries. I restrict my basic sample to directly-held subsidiaries because more complex ownership structures might be associated with enhanced tax planning opportunities. Mintz (2004) describes how intermediate entities provide internal loans to indirectly-held foreign affiliates and shows that tax incentives differ in this constellation. Wamser (2011) shows that the tax elasticity of investment decisions is different for indirectly-held subsidiaries.

As my dependent variable, I particularly consider the investment level in *Fixed Assets* of each subsidiary. Moreover, I consider a dummy variable *Former Profit* as a measure of the profitability in the past. This variable indicates whether there was a profit in the previous period. Furthermore, the firm-level data provides information on the existence of current losses and losses carried forward. I construct a variable which indicates the probability to make losses for subsidiaries engaged in the same industry. This variable *LRI* is the loss ratio per industry measured as the ratio of observable loss situations in a certain industry in a year divided by all subsidiaries regarding that industry in that certain year. A higher value may serve as a proxy of a higher probability of making losses. In doing so, I identify firms which are likely to suffer more from a more severe tax treatment of losses.³² A closer look shows cyclical changes of *LRI*. Across the time dimension of my sample, the overall mean value of *LRI* rises from 0.264 in 1998 to its maximum of 0.291 in 2001. Then it continuously declines to 0.219 in 2007, followed by a jump to 0.263 in 2008. Cyclical effects are stronger in some industries, while in other industries the probability to suffer a loss is less affected by changes in the overall economy. The food industry is an example for an industry which is almost unaffected by cyclical changes. Its value of *LRI* is about 0.285 for all years. By contrast, the industry of data processing shows significant fluctuation in *LRI* of, for example, 0.219 in 1998, 0.473 in 2001 and 0.289 in 2008.³³

Moreover, I use information on the existence of a loss carryforward taken from financial accounting as a proxy for the existence of a tax loss carryforward. Because my firm-level data solely provides financial accounting data, I only distinguish between the existence and non-

³² Alvarez and Koskela (2008) use volatility measures when analyzing the readiness to take risks. I apply this method in categorizing industries ex post on the basis of their volatility in terms of positive and negative business outcomes.

³³ The subsidiaries showing the highest values of *LRI* in particular years operate in the tourism industry (0.412), the housing industry (0.385) and the restaurant industry (0.396). Low values can be observed in the industries of advertising (0.148), market and opinion research (0.140) and the pharmaceutical industry (0.207).

existence of a loss carryforward. I construct a dummy variable *LCF Exists* indicating whether the respective subsidiary has accumulated losses in the past that can be used for an intertemporal offset. Notably, almost one third of all observations show a loss carryforward.

Furthermore, my study rests on the application of tax variables. First of all, I consider the statutory corporate tax rates for each host country in each year. Moreover, in my case, the tax loss treatment regulations are of major importance. Firstly, I consider whether a loss carryback is applicable. Table 4-7 in the Annex shows the countries where it is generally possible to carry back losses. A tax refund will only arise from a recalculation of the tax bill of the period to which the loss is carried back if the firm had taxable profits in the previous period. I form a dummy variable *No Carryback Option* which equals one if the respective subsidiary is not able to carry back a loss because the host country does not provide for a carryback rule or the respective subsidiary had no profit in the previous period.

Secondly, I take into account whether a loss carryforward is restricted. While all countries offer some form of loss carryforward, the carryforward is limited in time in a number of countries. Table 4-8 in the Annex provides an overview of loss carryforward provisions. I construct a dummy *LCF limited*, which is one if there is a limit on the maximum time a loss can be carried forward for.

Nine countries, including Bulgaria, China, Italy, Poland and South Korea, strictly limit loss carryforwards to five or less years during the whole considered period from 1996 till 2008. In twelve countries, the loss carryforward period is five or less years in 1996 but is relaxed to six or more years by 2008. Among them are Cyprus, France, Hungary and Japan. Accordingly, there does not seem to be a clear link between the tax treatment of loss carryforwards and other country characteristics like size or economic growth path. In 2008, 15 of those 25 countries which restrict the loss carryforward grant a limit of at least 6 years. Ten countries set their barriers at only five years. The simple dummy variable *LCF limited* does not distinguish between the different stages of severity of the loss carryforward limitation. I suppose, however, that it does matter how long losses can be used for. Especially a very tight limit might have a negative investment impact. Therefore, I split up the variable indicating whether the loss carryforward is limited. The dummy variable $LCF\ limited \leq 5$ is one if a loss carryforward is limited up to 5 years while the dummy $LCF\ limited > 5$ indicates if a loss carryforward is limited, but does not expire during a time span shorter than 6 years.

4. Investment Impact of Tax Loss Treatment

Table 4-1: Descriptive statistics

Variable	Definition	Mean	Std. Dev.
Fixed Assets	Fixed and intangible assets reported in the financial statements; measured in EUR '000.	13,182	80,507
Total Assets	Total assets reported in the financial statements; in EUR '000.	41,096	189,363
Sales	Annual sales, measured in EUR '000.	60,847	278,498
Profitability	Current profit divided by total assets.	.041	.229
Former Profit	Dummy variable showing if the company had (1) or did not have (0) a profit in the previous period.	.740	.438
Loss Ratio per Industry (LRI)	The loss ratio of the industry, i.e. observed losses in a certain industry during a year divided by all observations of this industry in this year.	.257	.056
Loss Ratio per Country (LRC)	Observed losses in a certain country during a year divided by all firm observations of this country in this year.	.256	.072
PRI Sister Companies	Product of the profit ratios of the industry and year for all sister companies located in the same host country.	.183	.348
LCF Exists	Dummy variable showing if the subsidiary has (1) or does not have (0) a loss carryforward.	.289	.453
Tax Rate	Statutory profit tax rate.	.318	.072
No Carryback Option	Dummy variable showing if the subsidiary has (0) or has not (1) the opportunity to carry back a loss of the current period.	.840	.367
No Group Taxation	Dummy variable showing if the country of the subsidiary does not provide (1) or provides (0) for the netting of profits and losses of different legal entities.	.342	.474
LCF limited	Dummy variable showing if a country limits (1) or does not limit (0) the maximum time a loss can be carried forward.	.643	.479
LCF limited ≤ 5	Dummy variable showing if there has been a maximum loss carryforward period of five or less years (1) or if the barrier was broader or even nonexistent (0).	.329	.470
LCF limited > 5	Dummy variable if there has been a limited maximum loss carryforward period of six or more years (1) or not (0).	.315	.464
GDP	Gross Domestic Product measured in billion current USD.	1,790	3,055
GDP per Capita	Gross Domestic Product per home country national; measured in current USD '000.	25.948	15.450
Inflation Rate	Inflation rate based on consumer prices.	.034	.048
Country Risk	OECD Country Risk Classification Method measures the country credit risk. Risk categories span from a low credit risk (0) to a high credit risk (7).	.758	1.375

59,917 observations. Firm-specific variables are derived from the MiDi database of the German Central Bank. The tax variables are derived from information taken from the IBFD Tax Handbooks and the Worldwide Corporate Tax Guides by Ernst & Young. *GDP*, *GDP per Capita* and *Inflation Rate* stem from the World Development Indicators, edition 2009. *Country Risk* is based on information provided by the OECD.

Moreover, I consider restrictions to consolidate losses within a group of firms. While cross-border loss offset is hardly ever allowed, some host countries offer a loss consolidation between affiliated companies located in that respective country. Yet, 17 of the 41 considered countries do not offer the possibility of national group taxation in 2008. Among them are, again, rather distinct economies like, for example, Brazil, Canada, China, Hungary, or Switzerland. Countries like Cyprus, Japan, and Poland introduced group taxation regimes between 1996 and 2008. Table 4-9 in the Annex provides further insights in group taxation rules of the analyzed countries. The variable *No Group Taxation* indicates that such a rule does not exist in the respective country.

Finally, I consider additional country-level control variables from various sources. I use host country *GDP*, *GDP per Capita* and the *Inflation Rate*, all taken from the World Bank's World Development Indicators. The *Country Risk* scaling from 0 to 7 with higher values corresponding to higher risk is derived from the OECD. Table 4-1 summarizes all variables and Table 4-10 in the Appendix provides a correlation matrix.

4.5. The Impact of Tax Treatment of Potential Future Losses

4.5.1 Main Results

In this section, I present the regression results for the investment impact of tax loss treatment rules. I start with an analysis of data aggregated at the host country level. Table 4-2 shows the results. As found in previous studies, I can confirm a negative effect of the tax rate. All tax loss treatment variables are, however, insignificant. Thus, I do not identify any significant impact of a denial of a group tax regime, a loss carryback or a limitation of a loss carryforward on investments.

I proceed with an analysis of firm-level micro data. This approach allows a proxy for the different relevance of tax loss treatment rules across firms to be taken into account. Nevertheless, some of the variables which are important for my identification only vary within country-year cells. Moulton (1990) and Bertrand et al. (2004) show that the presence of a common random effect at the country-year level has to be taken into account. Thus, I use a variance-covariance matrix allowing for random group effects by clustering in country-year cells.³⁴

³⁴ In unreported regressions I also cluster standard errors at the country level. Then standard errors are slightly higher but my general propositions remain qualitatively unchanged.

4. Investment Impact of Tax Loss Treatment

Table 4-2: Investment effects of tax loss treatment on aggregated fixed assets

	(1)	(2)	(3)	(4)
Tax Rate	-.902* (.517)	-.918* (.518)	-.925* (.515)	-.918* (.516)
No Group Taxation		-.137 (.181)	-.137 (.181)	-.127 (.186)
No Carryback Option			.027 (.083)	.027 (.083)
LCF limited				.051 (.068)
ln (GDP)	-3.03* (1.54)	-2.58 (1.81)	-2.55 (1.82)	-2.50 (1.81)
ln (GDP per Capita)	3.49** (1.53)	3.04* (1.79)	3.01* (1.79)	2.96* (1.78)
Inflation Rate	.052*** (.006)	.052*** (.006)	.052*** (.006)	.052*** (.006)
Country Risk	-.081** (.35)	-.085** (.035)	-.085** (.035)	-.085** (.035)
Observations	473	473	473	473

Dependent Variable: ln (Fixed Assets), aggregated at the host country level. Year dummies for 1997-2008 are included but not reported. Robust standard errors, clustered in country cells, are shown in parentheses. *, ** and *** show significance at the level of 10%, 5% and 1% respectively.

The results in Table 4-3 confirm that the tax rate has a negative impact on investment levels. The point estimator of column (1) suggests that a tax rate which is one percentage point higher is associated with 0.515% less investment in fixed assets. The regression results presented in columns (3), (6) and (8) follow a dynamic IV estimation approach. In the dynamic estimation, the point estimator concerning the tax rate presented in column (3) suggests that a tax rate which is one percentage point higher is associated with 0.425% less investment in fixed assets; however, this is only a short-run effect. Taking the results presented in column (3), the long run effect amounts to -1.380.³⁵

In accordance with the results found in aggregated data, the plain variables indicating tax loss treatments are insignificant. Therefore, I take into account a proxy for the expectation to make losses. I consider the probability of facing losses in the industry (*LRI*). The positive sign of the plain *LRI* variable, which is not always significant, indicates that investments tend to be higher where losses are reasonably anticipated. The *LRI* variable allows me to build interaction terms providing information on how firms with a high loss probability react to certain tax loss treatment rules.

³⁵ By assuming that $\ln(\text{Fixed Assets}_{i,t}) = \ln(\text{Fixed Assets}_{i,t-1})$ in the long-run equilibrium, the long-run effect can be calculated as $\beta_2/(1-\beta_1)$. Using the point estimators of column (1) in Table 4-3, the long run effect is $-0.425 / (1-0.692) = -1.380$.

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Table 4-3: Investment effects of tax loss treatment rules

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax Rate	-.515*** (.196)	-.522*** (.199)	-.425* (.251)	-.517*** (.197)	-.525*** (.198)	-.433* (.252)	-.532*** (.191)	-.439* (.253)
LRI		.223*** (.079)	.147 (.095)	.387*** (.137)	.428*** (.143)	.284* (.164)	.355*** (.137)	.219 (.154)
No Group Taxation		.024 (.056)	.045 (.052)	.015 (.057)	.010 (.057)	.034 (.055)	.009 (.059)	.032 (.055)
(No Group Taxation) x LRI		-.286** (.140)	-.299* (.180)	-.248* (.142)	-.234 (.146)	-.261 (.188)	-.229* (.140)	-.253 (.186)
No Carryback Option				.055 (.042)	.053 (.043)	.021 (.052)	.030 (.042)	.001 (.049)
(No Carryback Option) x LRI				-.208 (.143)	-.197 (.147)	-.077 (.183)	-.190 (.141)	.001 (.173)
LCF limited					.014 (.039)	.025 (.057)		
(LCF limited) x LRI					-.084 (.140)	-.129 (.174)		
LCF limited <=5							.077 (.057)	.083 (.080)
LCF limited >5							-.024 (.040)	-.012 (.055)
(LCF limited <=5) x LRI							-.344** (.175)	-.361* (.218)
(LCF limited >5) x LRI							.145 (.149)	-.073 (.193)
ln (Fixed Assets _{t-1})			.692*** (.056)			.692*** (.056)		.691*** (.056)
Former Profit	.011** (.005)	.011** (.005)	.026*** (.006)	.012** (.005)	.011** (.005)	.027*** (.006)	.012** (.005)	.027*** (.006)
ln (GDP)	-.997 (.766)	-.900 (.775)	.066 (1.00)	-.916 (.774)	-.903 (.775)	.077 (.999)	-.891 (.765)	.083 (.993)
ln (GDP per Capita)	1.74** (.760)	1.65** (.768)	.174 (.991)	1.67** (.766)	1.66** (.767)	.166 (.989)	1.65** (.756)	.164 (.983)
Inflation Rate	-.010 (.022)	-.010 (.021)	.062** (.030)	-.009 (.021)	-.009 (.022)	.063** (.030)	-.007 (.021)	.064** (.031)
Country Risk	-.019 (.016)	-.019 (.016)	-.004 (.021)	-.020 (.016)	-.020 (.016)	-.004 (.021)	-.019 (.015)	-.004 (.021)
Observations	59,917	59,917	59,917	59,917	59,917	59,917	59,917	59,917
Subsidiaries	11,727	11,727	11,727	11,727	11,727	11,727	11,727	11,727
AR(1)-Test			.000			.000		.000
AR(2)-Test			.459			.458		.457
First-Stage F-Statistic			723.87			723.75		723.36

Dependent Variable: ln (Fixed Assets). Year dummies for 1997-2008 are included but not reported. Robust standard errors, clustered on a country-year level, are shown in parentheses. *, ** and *** show significance at the level of 10%, 5% and 1% respectively. Numbers reported for the Hansen *J*-test of overidentification restrictions and for the test of second order auto-correlation (AR(2)) are *p*-values.

In columns (2) and (3), I insert the interaction between *LRI* and the dummy variable indicating that a group taxation regime does not exist. The negative coefficients for the interaction suggest that the denial of group taxation is relevant for subsidiaries facing a relatively high probability of suffering losses. The effect of an absent group taxation rule can

be calculated by inserting different values of *LRI* to the interaction term. Evaluating at mean values, the results presented in column (2) suggest that an absent group taxation regime impacts investment by about -7.3% (-0.286×0.257). While some results support the hypothesis H4-3, the effects are not robust across the specifications in Table 4-3.

I proceed with an analysis of the intertemporal tax loss treatment. Hypothesis H4-1 states that a company which does not have the opportunity to carry back potential losses is supposed to invest less because no immediate tax refund occurs. As can be seen from columns (4) to (8), neither the effect of the denied carryback nor the effect of the interaction term with *LRI* is significant. Thus, I cannot provide evidence that the carryback option influences investment decisions - not even for those firms having a high loss probability. Basically, this outcome is surprising because analytical considerations suggest a positive investment impact. Yet, only seven of the considered countries allow a loss carryback and the variation across time is limited regarding this aspect (see Table 4-7 in the Annex). Still, there might be another reason for the unexpected insignificance. I analyze multinational subsidiaries and not standalone firms. Thus, the tax effects of losses on investment might be less pronounced compared to standalone firms. Multinational subsidiaries might benefit from transfer pricing or internal capital markets via shifts between equity and debt financing. Nonetheless, my results suggest that some tax loss treatment rules still matter.

In particular, I analyze whether a general limitation of the time span a loss can be carried forward for exerts a negative effect on investment decisions. Columns (5) and (6) of Table 4-3 show insignificant effects of such a general barrier to investment. Effects are also insignificant once I differentiate between firms which are rather unlikely to suffer losses and firms operating in industries associated with a high probability of making losses. Therefore in columns (7) and (8), I distinguish between a shorter time span (≤ 5 years) and a longer time span (> 5 years) until a loss carryforward expires. The benchmark case is still no limitation of the loss carryforward.

When distinguishing between the severities of loss carryforward limitations, the results confirm my expectations expressed in hypothesis H4-2. The results suggest that a very short carryforward period affects investment. Here, I find a statistically significant effect for the interaction term with the industry-level loss probability. A tight limit on the maximum loss carryforward period exerts a negative impact on investment of firms operating in industries where the probability to suffer losses is relatively high. By contrast, it hardly seems to affect investment decisions if the loss carryforward is unlimited or if it forfeits after a rather long

time span. The different impact of the loss carryforward restriction depending on its severity reflects the expectations expressed in the previous literature. While the considerable effect of a severe carryforward limitation confirms the expectations by Eeckhoudt et al. (1997), the insignificance of limitations in longer time spans is in accordance with Barlev and Levy (1975) and MacKie-Mason (1990).

The respective significant coefficient of -0.344 for the interaction term in column (7) suggests that a severe loss carryforward limitation of only up to 5 years has a detrimental effect on investment. Evaluated at the mean value of *LRI*, my result suggests a negative investment impact of about 9% (-0.344×0.257). The span of considerable effects can be illustrated by the application of the highest and lowest values of *LRI* which were observed for particular industries in particular years. In the housing industry (*LRI* of 0.385), the negative investment effect amounts to 13.2%. For the low *LRI* in the pharmaceuticals industry (*LRI* of 0.207), the effect is only -7.1%. Consequently, the limitation of a loss carryforward is not universally important, but is taken into account by companies with high loss expectations.

Let us briefly discuss the effects of the control variables. A profit in the former period leads to higher investment, which can be attributed to increased liquidity as well as to positive signaling effects if local managers run for investment funds provided by the CEO. I do not find significant effects for the size of the host country's local market indicated by the GDP. This seems to come as a surprise; but it should, however, be taken into account that I estimate in first differences. Therefore, my approach removes time-invariant cross-country variations from the regressions. The GDP per capita, which can be interpreted as a proxy for labor costs, shows a positive coefficient in some specifications. This positive coefficient can be explained by a substitution effect between labor and capital in the production process. Regarding country risk, the negative sign indicates that a higher country risk is associated with less investment by subsidiaries of German multinationals; this effect, however, is not significant. Finally, the inflation rate shows a significant impact only in the dynamic setup. The positive effect can be explained by advantages of intra-group exchanges and an increased incentive for real investment.

4.5.2 Robustness Checks

Table 4-4 shows results of additional regressions. Column (1) mainly replicates my base specification but here I focus on the impact of group taxation rules and limitations of a loss carryforward. Column (2) considers an adjusted sample. I exclude the 138 cells where the loss ratio of the industry (*LRI*) is based on observations of only one or two firms. In doing so, I

come across potential endogeneity concerns. My general findings are robust against this sample adjustment.

Regressions in columns (3) and (4) are intended to provide robustness of the approximation of the different loss probabilities across firms. My general setup of *LRI* assumes that firms judge their risk of suffering losses based on the current situation of their industry. But firms might take several periods into account. In column (3), *LRI* is based on the ratio between losses and all observations in the industry in both the current and the previous year. The *LRI* variable of column (4) even regards information from the current year and the two preceding years. The initial results concerning the impact of tax loss treatment provisions are confirmed when I calculate the loss ratio of the industry as a biannual or triannual average. The interaction term between the denied group taxation and the respective *LRIs* presented in columns (3) and (4) is negative but only statistically significant when assuming a loss ratio calculated on the basis of two years. Yet, the interaction between the tight carryforward limitation and the respective *LRIs* is always negative and significant. These findings support the view that firms particularly consider information on the loss probability from recent years.

In my base specifications I have approximated to the expected loss probability of a firm by means of the loss ratio per industry. In column (5) of Table 4-4 I also consider a country dimension of loss probability. I include a variable *LRC* which is the annual number of loss observations in a country divided by all annual observations in this country. The plain *LRC* shows a negative sign but is insignificant. Moreover, the interaction terms of *LRC* with most of the indicators for the tax loss treatment are also insignificant. Only the interaction between *LRC* and the dummy indicating a less strict loss carryforward limitation is weakly significant. At the same time, the significant interaction terms with the *LRI* prevail. I argue that these results suggest that an industry-specific loss ratio does approximate a firm's expectation of making losses better than a host-country specific loss ratio does.

The results for the impact of group taxation are rather mixed. Columns (6) and (7) should provide additional insight in the impact of group taxation. In column (6), I estimate separate effects for the response to a higher loss probability for subsidiaries that can benefit from a group tax regime and for subsidiaries that do not benefit. The response to a higher loss expectation is highly significant if a group taxation regime is available whilst completely insignificant if no group taxation regime can be applied.

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Table 4-4: Investment effects of tax loss treatment rules – robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	<i>Base Case</i>	<i>Adjusted Sample</i>	<i>Alternative LRI Specifications</i>	<i>Country Loss Ratio</i>	<i>Group Taxation</i>	<i>Country-Year Dummies</i>	<i>Country-Year Dummies</i>	<i>Additional Interactions</i>	<i>Alternative Dependent Variables</i>		
No Group Taxation	.013 (.058)	.015 (.058)	.081 (.074)	.044 (.097)	.007 (.075)	.013 (.058)	.015 (.059)		-.044 (.065)	-.024 (.041)	.013 (.060)
(No Group Taxation) x LRI	-.244* (.140)	-.251* (.142)	-.483** (.223)	-.381 (.330)	-.240* (.128)	.030 (.154)	.028 (.155)	-.103 (.133)	-.021 (.169)	-.008 (.095)	-.021 (.103)
(No Group Taxation) x LRC					.014 (.198)						
(Group Taxation) x LRI						.274*** (.101)	.264*** (.102)				
(Group Taxation) x LRI x (PRI Sister Companies)							.043 (.126)				
LCF limited <=5	.082 (.056)	.086 (.056)	.166** (.082)	.135 (.105)	.102 (.073)	.082 (.056)	.084 (.056)		.060 (.053)	.050 (.031)	.136*** (.032)
LCF limited >5	-.024 (.041)	-.021 (.041)	.046 (.053)	.060 (.080)	-.081 (.054)	-.024 (.041)	-.022 (.041)		-.007 (.039)	-.041* (.025)	.011 (.031)
(LCF limited <=5) x LRI	-.363** (.172)	-.380** (.174)	-.677*** (.263)	-.583* (.339)	-.323** (.156)	-.363** (.172)	-.376** (.173)	-.104 (.176)	-.290* (.160)	-.178* (.108)	-.459*** (.112)
(LCF limited >5) x LRI	.145 (.150)	.132 (.151)	-.141 (.219)	-.254 (.318)	.053 (.145)	.145 (.150)	.135 (.151)	-.026 (.151)	.072 (.143)	.165* (.094)	-.152 (.094)
(LCF limited <=5) x LRC					-.098 (.225)						
(LCF limited >5) x LRC					.437* (.232)						
LRI	.274*** (.101)	.296*** (.104)	.809*** (.170)	.868*** (.260)	.298*** (.100)			.189* (.111)	-.049 (.407)	.009 (.056)	.119* (.071)
LRC					-.246 (.235)						
PRI Sister Companies							-.118*** (.031)				
Control Variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country-Year Dummies								✓			
Interactions with Country Controls									✓		

Dependent Variable: ln (Fixed Assets) in all columns except (10) and (11); ln (Total Assets) in column (10); ln (Sales) in column (11). Column (1) corresponds to the specification (7) in Table 4-4-3, leaving out the insignificant carryback aspect. In column (2), I leave out 138 observations where the LRI is based on only one or two firms. In column (3), the loss ratio per industry is calculated based on the current and the previous year, in column (4) it is based on the current and the previous two years. The LRC variable in column (5) is the loss ratio per country and year. In column (7) PRI Sister Companies is the probability that at least one sister company in the country makes a profit. In column (8), country-year dummies are included. In column (9), unreported interaction terms of LRI with ln(GDP), tax rate, inflation rate and country risk are included. The control variables include the tax rate, ln(GDP), ln(GDP per capita), inflation rate, and country risk. Robust standard errors, clustered on a country-year level, are shown in parentheses. Year dummies for 1997-2008 are included but not reported. *, ** and *** show significance at the level of 10%, 5% and 1% respectively.

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Group taxation, however, might only matter if affiliated companies do not lose money at the same time. In these cases, losses reduce taxable profits directly. In order to scrutinize this aspect, I introduce the variable *PRI Sister Companies*. This variable considers the profit ratios per industry of the sister companies and approximates the probability that at least one sister company in the respective country makes a profit. The probability is determined as one minus the product of the national sisters' *LRIs*. Referring to this measure rather than to the actual profits of the sister companies avoid endogeneity concerns.³⁶ I expect a positive effect for the interaction of *PRI Sister Companies* with the group taxation dummy and my loss probability measure *LRI*. The effect shows the expected positive sign but it is not statistically significant. By contrast, the effect for my simple interaction between the group taxation dummy and the *LRI* remains rather unaffected in size and significance. Thus, I cannot confirm that a firm's appreciation of the group taxation regime depends on the expected or current performance of its affiliated companies.

Column (7) reveals a negative and significant effect for the plain variable *PRI Sister Companies*. Group resources might rather be allocated to affiliated subsidiaries if profits of these affiliates become more likely. This finding relates to another possible explanation for my mixed results for the group taxation effect. A multinational can react to the denial of a group taxation regime by investing less but also by choosing an appropriate organizational structure. If multinationals tend to have more subsidiaries in host countries offering a group taxation regime, they may set up new subsidiaries, rather than increase the investment stock of an existing one. Consequently, I may underestimate the total effect of group taxation on marginal investment by a multinational per host country.

Since the indicators for tax loss treatment provisions vary in the country-year cells, one might be concerned by spurious correlations with unobserved country characteristics. In column (8), I include country-year dummies for all combinations of the 41 countries and 13 years. As a consequence, all those variables which only vary on a country-year basis cannot be identified. In this setup, however, I am unable to find significant effects concerning the impact of the tax loss treatment on investment. This suggests that the remaining variation after including about five hundred country-year dummies does not suffice for the identification of the supposed effects.

³⁶ In unreported additional regressions I also refer to a binary variable indicating if affiliated companies report actual profits. The results are however very similar to those reported in column (7) of Table 4-4.

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In column (9) I do not control for country-year effects, but I include additional interaction terms of the loss ratio variable with country characteristics. For reasons of brevity, I do not report the detailed coefficients for each included interaction term. The additional interaction terms prove to be insignificant but only the one between country risk and *LRI* is statistically significant. The effect suggests that investments are particularly small in industries with a high probability to make losses once the regarded firm is at the same time located in a risky country. Interestingly, the interaction term between *LRI* and the host country tax rate is also insignificant. This finding confirms that firms with higher loss probabilities have a more pronounced response to tax loss treatment rules but not to the general tax rate. Column (9) shows that the crucial interaction terms based on the severity of the loss carryforward limitation remain qualitatively the same as in my base result. The interaction term dealing with the absence of a group taxation regime shows the expected direction, but loses its significance once the additional interaction terms are included.

Finally, in columns (10) and (11), I use alternative dependent variables and measure investment by total assets and sales. The interaction term between *No Group Taxation* and *LRI* turns out to be insignificant when investment is measured based on total assets or sales. The strong time limit of the loss carryforward, however, still exerts a negative and significant investment impact on firms facing a relatively high probability of suffering losses.³⁷

4.6 Effects of Existing Losses Carried Forward

4.6.1 Main Results

In this section, I trace hypotheses H4-4 and H4-5 dealing with the effect of an existing loss carryforward on investment decisions. I use empirical settings which are very similar to the one presented in Section 5 and pay particular attention to the existence of a loss carryforward. The basic results are shown in Table 4-5. First of all, I take into account the existence of a loss carryforward and insert the dummy variable *LCF Exists*, indicating if the respective subsidiary has accumulated losses in the past. Columns (1) and (2) show an overall negative investment effect of an existing loss carryforward. Yet, hypotheses H4-4 and H4-5 stated in Section 2.2 suggest opposing effects of a loss carryforward. Therefore, from column (3)

³⁷ The counterintuitive positive effect of *LCF limited* ≤ 5 in column (11) only measures a hypothetical fraction of the overall effect. This can be seen by calculating the overall effect. The 1%-percentile of *LRI* shows a value of 0.167. Therefore, the overall effect is small for this lower boundary of *LRI* ($0.167 \times (-0.459) + 1 \times 0.136 = 0.06$) and negative for industries with a higher probability to suffer losses. The same applies to column (3).

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onwards I consider an interaction term between *LCF Exists* and the tax rate to separate the impact of an existing loss carryforward on the tax rate elasticity from the non-tax effects.

Concerning hypothesis H4-4, my empirical results suggest that an existing tax loss carryforward results in lower investment in the following periods. This conclusion can be drawn from the results of columns (3) to (8). The investment impact of an existing loss carryforward is always negative. Even the size of the measured effect hardly differs across my estimation setups. The significant coefficient for an existing loss carryforward of about -0.117 in column (3), for example, suggests that investment measured by the stock of fixed assets is by about 11.7% lower if a loss carryforward is present as compared to a situation in which it was not present. The result can be attributed to liquidity and signaling effects if the business activities generated losses in the past. One might argue that a subsidiary of a multinational group should not fall short of liquidity given its ability to demand funds from the parent company. Still, in this case the negative signal of a loss persists and might have a detrimental effect on the readiness of the CEO to continue investing in the respective subsidiary.

While I find a negative effect of taxes on investment decisions in general, columns (3) to (8) show that the net tax effect is significantly smaller in absolute values if a subsidiary is still carrying forward losses. The interaction term between the statutory corporate income tax rate and a dummy variable indicating an existing loss carryforward is positive. This confirms my theoretical expectations outlined in Hypothesis H4-5. The statutory tax rate should become less important if losses carried forward can be used to offset profits from new investments.

Once a loss carryforward exists, future profits remain effectively untaxed as long as this loss carryforward can be used. In the estimation presented in column (3), the point estimator for the tax rate amounts to -0.614 and the point estimator for the interaction term between tax rate and the dummy indicating an existing loss carryforward is 0.305. This means that the presence of losses absorbs about half of the negative tax rate effect. This result confirms what, for instance, Creedy and Gemmel (2008) have worked out analytically.

It appears reasonable that the tax rate effect is not entirely counterbalanced because the size of the loss carryforward might not suffice to absorb all future profits. Furthermore, as discussed above, in many countries loss carryforwards expire after several years. Moreover, I may underestimate the adverse tax effects of a loss carryforward. Some firms in my sample may not benefit from offsetting future profits with the existing loss carryforward because the tax shield of a loss carryforward offsets accelerated depreciation or interest deductions.

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Table 4-5: Existing losses carried forward and tax rate elasticity of investment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax Rate	-.514*** (.197)	-.418* (.248)	-.614*** (.203)	-.527** (.254)	-.645*** (.201)	-.551** (.260)		
LCF Exists	-.018** (.008)	-.017* (.009)	-.117*** (.037)	-.125*** (.042)	-.120*** (.037)	-.126*** (.042)	-.125*** (.038)	-.132*** (.042)
(Tax Rate) x (LCF Exists)			.305*** (.109)	.330*** (.125)	.288*** (.109)	.325*** (.127)	.331*** (.113)	.350*** (.128)
ln (Fixed Assets _{t-1})		.690*** (.056)		.690*** (.056)		.690*** (.056)		.664*** (.051)
Former Profit	.008* (.005)	.024*** (.006)	.009* (.005)	.024*** (.006)	.009* (.005)	.024*** (.006)	.010** (.005)	.027*** (.006)
ln (GDP)	-.979 (.767)	.008 (.986)	-.973 (.768)	.014 (.985)	-.863 (.766)	.103 (.994)		
ln (GDPperCapita)	1.73** (.761)	.229 (.978)	1.72** (.762)	.222 (.978)	1.62** (.758)	.143 (.984)		
Inflation Rate	-.011 (.022)	.061** (.030)	-.011 (.022)	.061** (.030)	-.008 (.021)	.063** (.030)		
Country Risk	-.019 (.016)	-.004 (.021)	-.019 (.016)	-.004 (.021)	-.019 (.015)	-.004 (.021)		
Loss Treatment Rules					✓	✓		
Country-Year Dummies							✓	✓
Observations	59,917	59,917	59,917	59,917	59,917	59,917	59,917	59,917
Subsidiaries	11,727	11,727	11,727	11,727	11,727	11,727	11,727	11,727
AR(1)-Test		.000		.000		.000		.000
AR(2)-Test		.4378		.4354		.4437		.5246
First-Stage F-Statistic		718.74		718.85		722.22		347.09

Dependent Variable: ln (Fixed Assets). Year dummies for 1997-2008 are included but not reported. Robust standard errors, clustered on a country-year level, are shown in parentheses. *, ** and *** show significance at the level of 10%, 5% and 1% respectively. Numbers reported for the Hansen J-test of overidentification restrictions and for the test of 2nd order auto-correlation (AR(2)) are p-values.

My analysis builds on the analytics of Auerbach (1986), who identified both the general negative aspect and the tax-driven positive investment aspect of an existent loss carryforward. My empirical results show that the two effects are significant. Which of these two effects dominates depends on the tax rate. This result is intuitively clear because the value of the loss carryforward is directly linked to the tax rate. Based on the coefficients of the existent loss carryforward (-0.117) and the interaction term (0.305) presented in column (3), the overall investment impact of an existing loss carryforward is negative if the tax rate is below 38.4% and positive if the tax rate exceeds this threshold.

4.6.2 Robustness Checks

In Section 5, I have presented evidence that tax loss treatment rules matter for companies' general investment behavior. Therefore, in columns (5) and (6) of Table 4-5, I also include the tax loss treatment variables which were proven to be important, namely the different carryforward limitations and the group taxation. As can be seen from the results, the reduced

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tax rate elasticity in the presence of a loss carryforward remains unaffected. While tax loss treatment provisions generally affect the investment behavior of all firms, a loss carryforward affects the tax rate elasticity of investment of the subgroup of firms that already have suffered from losses in the past.

As a further robustness check, in columns (7) and (8) of Table 4-5, I add country year dummies for all combinations of the 41 countries and 13 years. Again, all those variables which only vary on a country-year basis cannot be identified. The results of this setup support my general findings. I find a negative investment effect and a lower tax rate elasticity of investment if a firm carries forward a loss.

Recently, Edgerton (2010) finds that the interaction of the tax rate and the carryforward variable is no longer important when including interactions of the tax rate with other firm characteristics, such as cash flows. Since there is no information on cash flows in my data set, I include sales and profitability in additional robustness checks in Table 4-6. Moreover, in columns (2) - (4), I also use interaction terms with the tax rate. The positive and significant interaction term between the tax rate and the existence of a loss carryforward is unaffected. However, as compared to the values of the interaction terms in Table 4-5, the size effect is a little lower once the additional controls are included. Concerning the additional control variables, sales have a positive and significant impact on investment while the impact of profitability is either negative or insignificant.

Nevertheless, there are important differences between my analysis and the study by Edgerton (2010) which may explain the different findings. Apart from several differences regarding empirical frameworks and dependent variables, the studies consider very different types of firms. While Edgerton (2010) uses a sample of mainly domestic US and Canadian firms excluding almost all subsidiaries, I exclusively consider subsidiaries of multinational firms. Investment decisions of subsidiaries are less constrained by cash flow because they can benefit from the internal capital market of the multinational firm. This fact may explain why I identify effects of a loss carryforward on the tax response of investment decisions.

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Table 4-6: Existing losses carried forward - additional robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Including further controls</i>				<i>Alternative dependent variables</i>			
Tax Rate	-.542*** (.191)	-1.57* (.906)	-.628*** (.203)	-1.56* (.906)	-.295*** (.136)	-.342*** (.136)	-.185 (.120)	-.197* (.118)
LCF Exists	-.099*** (.035)	-.101*** (.036)	-.120*** (.037)	-.102*** (.035)	-.031*** (.004)	-.077*** (.021)	.005 (.005)	-.007 (.026)
(Tax Rate) x (LCF Exists)	.239** (.105)	.243** (.106)	.299*** (.110)	.243** (.106)		.141** (.063)		.035 (.075)
Sales	.184*** (.012)	.152*** (.032)		.152*** (.033)				
(Tax Rate) x (Sales)		.104 (.088)		.102 (.088)				
Profitability	.006 (.012)		-.067** (.033)	-.004 (.024)				
(Tax Rate) x (Profitability)			.519*** (.206)	.052 (.145)				
Former Profit	.007 (.005)	.007 (.005)	.012** (.005)	.007 (.005)	.001 (.003)	.001 (.003)	.003 (.004)	.003 (.004)
Country Control Variables	✓	✓	✓	✓	✓	✓	✓	✓
Observations	58,560	58,560	59,917	58,560	59,917	59,917	58,560	58,560
Subsidiaries	11,727	11,727	11,727	11,727	11,447	11,447	11,727	11,727

Dependent Variable: \ln (Fixed Assets) in columns (1) to (4), \ln (Total Assets) in columns (5) and (6) and \ln (Sales) in columns (7) and (8). Year dummies for 1997-2008 are included but not reported. Robust standard errors, clustered on a country-year level, are shown in parentheses. *, ** and *** show significance at the level of 10%, 5% and 1% respectively.

In an additional set of robustness checks presented in columns (5) to (8) of Table 4-6, I change the dependent variable serving as my proxy for investment. I test the impact of an existing loss carryforward on sales and on total assets. When total assets are used in columns (5) and (6), both the general negative investment impact of the existing loss carryforward and the reduced tax rate elasticity of investment measured by the interaction term can be identified. Based on the positive interaction term between the tax rate and the existence of a loss carryforward amounting to 0.141 in column (6), almost half of the negative tax effect is compensated once loss carryforwards are present. However, the effects on total assets are a little weaker than on fixed assets. As columns (7) and (8) show, sales are not affected by existing loss carryforwards and hardly seem to be affected by profit taxes at all.

4.7 Concluding Remarks

I have analyzed the investment impact of tax loss treatment using data of subsidiaries of multinational firms. First, I have focused on the treatment of *potential* losses. I find significant effects of the intertemporal loss offset provision when paying particular attention to the probability of making losses. Based on my estimation results, a limitation of the maximum loss carryforward to five or less years has a detrimental effect on investments of a subsidiary

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which faces a high loss probability. I am, however, unable to identify statistically significant effects of the possibility to carry back a loss to previous periods. While some of my results suggest that investment decisions of subsidiaries facing a high loss probability are affected by the existence of a group taxation regime, the results for the impact of group taxation regime is not robust across specifications.

Secondly, I have analyzed the impact of *existing* loss carryforwards on investment. Due to liquidity and signaling effects, lower investment occurs in the presence of a loss carryforward. Additionally, I find a reduced tax elasticity of investment for companies actually shielded by existing losses. Thus, the negative impact of a high corporate tax rate is lowered if a firm has a loss carryforward.

As can be seen from Tables 4-7 to 4-9 in the Annex, tax treatment of losses tends to have become more generous between 1996 and 2007. Given that many countries have changed their tax loss offset rules during the last decades, my results are generally interesting for policy-makers. The basic question that arises is whether host countries should offer more favorable or less favorable rules to carry forward losses. My results suggest that a time limit until a loss carryforward expires should not be too short.

If some subsidiaries, however, already had losses in the past, these firms make their investment decisions based on existing loss carryforwards. Then the policy implication is not so straight forward. On the one hand, the existence of a loss carryforward is favorable, particularly in high-tax countries, as the reduced tax rate elasticity of investment can channel additional foreign direct investment to the respective subsidiary. For example, if I suppose a tax rate of about 30%, the estimates of column (3) in Table 4-5 suggest that the negative investment effect in the presence of a loss carryforward is largely offset by the significantly smaller detrimental effect of the tax rate.³⁸ On the other hand, a generous recognition of losses for tax purposes can distort competition between those companies with and those without a loss carryforward because the former benefit from windfall profits, which are paradoxically caused by their failure in the past. Therefore, restricting the maximum number of years until losses carried forward expire may be a good idea not only from a fiscal perspective. Based on my results, a moderate restriction of the maximum time losses can be carried forward does not exert significant negative effects on investment.

³⁸ Considering estimates of column (3) in Table 4-5, a loss carryforward exerts a negative effect of about -0.117 but also an offsetting effect of about 0.0915 if I suppose a tax rate of about 30%.

4.8 Appendix

Table 4-7: Maximum loss carryback

Country	Loss Carryback 1996	Change	to	Loss Carryback 2008
Canada	3			3
Ireland	1			1
Netherlands	3	2007	1	1
Norway	0	2008	2	2
Sweden	0	1999	6	6
United Kingdom	3	1998	1	1
USA	3	1998	2	2

The table presents an overview of those countries which grant resident companies to carry back a loss. The columns show the maximum number of years losses could be carried back. Changes are reported in column (2). All countries not shown here do not provide for a loss carryback throughout the entire time span of 1996-2008.

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Table 4-8: Maximum loss carryforward

Country	Loss CF 1996	Change	to	Change	to	Change	to	Loss CF 2008
Australia	∞							∞
Austria	7	1998	∞					∞
Belgium	4	1997	∞					∞
Brazil	∞							∞
Bulgaria	5							5
Canada	7	2005	10	2007	20			20
China	5							5
Cyprus	5	2003	∞					∞
Czech Republic	7	2004	5					5
Denmark	5	2002	∞					∞
Estonia	5	2000	7					7
Finland	10							10
France	5	2004	∞					∞
Greece	5							5
Hungary	5	2004	∞					∞
Iceland	8	2004	9	2005	10			10
India	8							8
Ireland	∞							∞
Italy	5							5
Japan	5	2002	7					7
Latvia	5	2008	6					6
Lithuania	0	1998	3	1999	5	2008	25	25
Luxembourg	∞							∞
Malta	∞							∞
Mexico	10							10
Netherlands	∞	2007	9					9
New Zealand	∞							∞
Norway	10	2006	∞					∞
Poland	3	1999	5					5
Portugal	6							6
Romania	2	1997	3	1998	5			5
Russia	5	2002	10					10
Slovak Republic	5							5
Slovenia	5	2006	7	2007	∞			∞
South Korea	5							5
Spain	5	1997	7	1999	10	2002	15	15
Sweden	∞							∞
Switzerland	7							7
Turkey	5							5
United Kingdom	∞							∞
USA	15	1998	20					20

The table shows the number of years an unused loss carryforward can persist. The symbol ∞ means that loss carryforwards do not expire at all. The second and the sixth column show the regulation in the respective country for the years 1996 and 2008, while the columns in between reveal when the changes took place. In Austria, for example, unused loss carryforwards forfeited after seven years in 1996. This limit has been abolished in 1998.

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Table 4-9: Method of group taxation

Country	1996	Method in 1996	Change	to	2008
Australia	yes	Group Contribution	2002	Consolidation	yes
Austria	yes	Fiscal Unity			yes
Belgium	no				no
Brazil	no				no
Bulgaria	no				no
Canada	no				no
China	no				no
Cyprus	no		2003	Group Relief	yes
Czech Republic	no				no
Denmark	yes	Consolidation			yes
Estonia	no				no
Finland	yes	Group Contribution			yes
France	yes	Fiscal Unity			yes
Greece	no				no
Hungary	no				no
Iceland	no		1999	Consolidation	yes
India	no				no
Ireland	yes	Group Relief			yes
Italy	yes	TaxCredit Exchange	2000	Group	
			2004	Consolidation	yes
Japan	no		2003	Consolidation	yes
Latvia	no		1998	Group Relief	yes
Lithuania	no		2004	Group	yes
Luxembourg	yes	Fiscal Unity			yes
Malta	yes	Group Relief			yes
Mexico	yes	Consolidation			yes
Netherlands	yes	Consolidation			yes
New Zealand	yes	Group Relief			yes
Norway	yes	Group Contribution			yes
Poland	no		1997	Fiscal Unity	yes
Portugal	yes	Consolidation			yes
Romania	no				no
Russian Federation	no				no
Slovak Republic	no				no
Slovenia	yes	Consolidation	2007	no	no
South Korea	no				no
Spain	yes	Consolidation			yes
Sweden	yes	Group Contribution			yes
Switzerland	no				no
Turkey	no				no
United Kingdom	yes	Group Relief			yes
USA	yes	Consolidation			yes

In a consolidation or fiscal unity system, the financial statements of companies belonging to the same group are either made up together or merged at the end of the fiscal year. When there is a system of group contribution, the profitable subsidiary is enabled to contribute a part or all of its profits to the subsidiary which suffered a loss. Correspondingly, losses are transferred among subsidiaries in a group relief system. In effect, all of these systems enable the netting of profits and losses of different tax subjects. Therefore, I apply a dummy variable indicating if some kind of group taxation is available or not.

Table 4-10: Correlations of tax and non-tax variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) GDP	1.000									
(2) GDP per Capita	0.275	1.000								
(3) Country Risk	-0.308	-0.789	1.000							
(4) Inflation Rate	-0.160	-0.356	0.556	1.000						
(5) Tax Rate	0.579	0.144	-0.300	-0.097	1.000					
(6) No Group Taxation	-0.349	-0.461	0.505	0.231	-0.311	1.000				
(7) No Carryback	-0.334	-0.278	0.241	0.075	-0.123	0.246	1.000			
(8) LCF limited	0.111	-0.294	0.149	0.094	0.081	0.186	0.190	1.000		
(9) LCF limit<=5	-0.124	-0.411	0.275	0.150	-0.136	0.141	0.306	0.521	1.000	
(10) LCF Exists	0.054	-0.122	0.115	0.048	0.042	0.026	0.098	0.038	0.037	1.000

The correlations are based on the 59,917 observations which are used in the regression tables.

4.9 References

- Alvarez, L. and E. Koskela (2008): Progressive taxation, tax exemption, and irreversible investment under uncertainty, *Journal of Public Economic Theory* 10(1), 149-169.
- Anderson, T. and C. Hsiao (1982): Formulation and estimation of dynamic models using panel data, *Journal of Econometrics* 18(1), 47-82.
- Altshuler, R., A.J. Auerbach, M. Cooper and M. Knittel (2008): *Understanding U.S. corporate tax losses*, NBER Working Paper No. 14405.
- Auerbach, A.J. (1986): The dynamic effects of tax law asymmetries, *Review of Economic Studies* 53(2), 205-225.
- Auerbach, A.J. and J.M. Poterba (1987): Tax loss carryforwards and corporate tax incentives, in M. Feldstein (ed.): *The Effects of Taxation on Capital Accumulation*, Chicago, 305-342.
- Barlev, B. and H. Levy (1975): Loss carryback and carryover provision: effectiveness and economic implications, *National Tax Journal* 28(2), 173-184.
- Bertrand, M., E. Duflo, and S. Mullainathan (2004), How much should I trust differences-in-differences estimates? *Quarterly Journal of Economics* 119(1), 249-275.
- Buettner, T. and C. Fuest (2010): The role of the corporate income tax as an automatic stabilizer, *International Tax and Public Finance* 17(6), 686-698.
- Chirinko, R.S. (1993): Business fixed investment spending: modelling strategies, empirical results, and policy implications, *Journal of Economic Literature* 31(4), 1875-1911.
- Cooper, M. and M. Knittel (2006): Partial loss refundability: how are corporate tax losses used?, *National Tax Journal* 59(3), 651-663.
- Cooper, M. and M. Knittel (2010): The implications of tax asymmetry for U.S. corporations, *National Tax Journal* 63(1), 33-62.

- Creedy, J. and N. Gemmell (2008): *Behavioural responses to corporate profit taxation*, The University of Melbourne and The Treasury Research Paper No. 1029, New Zealand.
- De Mooij, R.A. and S. Ederveen (2003): Taxation and foreign direct investment: a synthesis of empirical research, *International Tax and Public Finance* 10(6), 673-693.
- Devereux, M.P. (1989): Tax asymmetries, the cost of capital and investment: some evidence from United Kingdom panel data, *Economic Journal* 99, 103-112.
- Devereux, M.P., M. Keen and F. Schiantarelli (1994): Corporation tax asymmetries and investment, *Journal of Public Economics* 53(3), 395-418.
- Devereux, M.P. and C. Fuest (2009): Is the corporate tax an effective automatic stabilizer?, *National Tax Journal* 62(3), 429-437.
- Domar, E.D. and R.A. Musgrave (1944): Proportional income taxation and risk-taking, *Quarterly Journal of Economics* 58(3), 388-422.
- Donnelly, M. and A. Young (2002): Policy options for tax loss treatment: How does Canada compare?, *Canadian Tax Journal* 50(2), 429-488.
- Edgerton, J. (2010): Investment incentives and corporate tax asymmetries, *Journal of Public Economics* 94(11-12), 936-952.
- Eeckhoudt, L., C. Gollier and H. Schlesinger (1997): The no-loss offset provision and the attitude towards risk of a risk-neutral firm, *Journal of Public Economics* 65(2), 207-217.
- European Commission (2011): Proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB), COM(2011) 121/4, Brussels.
- Lipponer, A. (2008): *Microdatabase direct investment – a brief guide*, Frankfurt.
- MacKie-Mason, J.K. (1990): Some nonlinear tax effects on asset values and investment decisions under uncertainty, *Journal of Public Economics* 42(3), 301-327.
- Majd, S. and S.C. Myers (1987): Tax asymmetries and corporate tax reform, in: M. Feldstein (Ed.), *The Effects of Taxation on Capital Accumulation*, Chicago, 343-376.
- Mintz, J.M. (1981): Some additional results on investment, risk taking, and full loss offset corporate taxation with interest deductibility, *Quarterly Journal of Economics* 96(4), 631-642.
- Mintz, J.M. (2004): Conduit entities: Implications of indirect tax-efficient financing structures for real investment, *International Tax and Public Finance* 11(4), 419-434.
- Mintz, J. and A. Weichenrieder (2010): *The indirect side of direct investment – multinational company finance and taxation*, MIT Press.
- Mossin, J. (1968): Taxation and risk-taking: an expected utility approach, *Economica* 35(1), 74-82.
- Moulton, B.R. (1990), An illustration of a pitfall in estimating the effects of aggregate variables on micro units, *Review of Economics and Statistics* 72(2), 334-338.
- Nickell, S.J. (1981): Biases in dynamic models with fixed effects, *Econometrica* 49(6), 1417-1426.
- Niemann, R. (2008): The effects of differential taxation on managerial effort and risk taking, *Finanzarchiv* 64(3), 273-310.
- Wamser, G. (2011), Foreign (in)direct investment and corporate taxation, *Canadian Journal of Economics* 44(4), 1497-1524.
- Wooldridge, J.M. (2002): *Econometric analysis of cross section and panel data*, Cambridge, Massachusetts, The MIT Press.

4.10 Survey 2: Empirical studies on tax loss treatment effects

Survey ³⁹	Data	Methodology	Results
Aarbu, MacKie-Mason (2003)	Tax data of about six thousand Norwegian corporations from the years 1988, 1991, 1992 and 1993.	Two-tailed Tobit estimator. Dependent variable: unutilized (accelerated) depreciation. The independent variable "TAXP" is 1 if the corporation has to pay taxes and it is 0, if it is in a tax-exempt position due to an existent tax loss carryforward.	Corporations deliberately abstain from using accelerated depreciations if they suffer losses or show loss carryforwards in a year. They first seem to aim at netting out the losses or loss carryforwards.
Albring, Dhaliwal, Khurana, Pereira (2010)	US corporations from the Compustat database, observed in the time span January 1, 1995 till July 31, 1998. Firm-level panel dataset. Additional institutional brokers estimation systems (I/B/E/S) data with one year analyst forecasts is used for a supplementary hypothesis test.	The dependent variables are accruals and deferrals in four different forms. The most important, binary, independent variable distinguishes whether a firm's fiscal year ended between August 31, 1997 and July 31, 2008 (1) or not (0).	The paper shows the effect of a change in the loss carryback on earnings management. The US "Taxpayer Relief Act" of 1997 lowered the tax loss carryback period from three years to two years. Therefore, the opportunity costs of not showing a tax loss in the year 1997 increased. By applying earnings management, firms show tax losses especially in the final year of the three year loss carryback period. In the two years preceding this year, the corporations tend to show profits.
Altshuler, Auerbach (1990)	Tax data provided by the Internal Revenue Service, tracing US corporations from 1971 till 1982.	The main form of the output is descriptive statistics. Additionally, there are calculations of marginal tax rates taking into account potentially existing tax loss carryforwards.	The descriptive insights refer to the amount of existing tax loss carryforwards and still utilizable saving amortizations. Based on book values, about 50% of all observed firms have a tax loss carryforward or a saving amortization. Statistics are also presented on an industry basis.
Altshuler, Auerbach, Cooper, Knittel (2008)	Tax data of US corporations from the years 1982 till 2005. The information stems from the IRS Statistics of Income (SOI) corporate tax return files, comprising 100,000 to 140,000 firm observations per year.	The overall trend of the aggregated micro data for all years 1982 till 2005 is presented in descriptive figures. Among others, these figures cover the fraction of losses relative to positive incomes, the losses per industry, losses of multinationals as compared to local corporations, losses by firm year, and a section on S-corporations.	Descriptive analysis dealing with the question why relatively more corporations showed tax losses in the economic crisis of 2001 than in previous crises. The two central provided explanations are the following: there was a strongly declined average rentability of C-corporations. Furthermore, in the years directly preceding the crisis many healthy firms opted for the transparent S-corporation and are therefore no longer included in the statistics as of 2001.

³⁹ Some of the methodologies' and results' summaries quote the respective papers literally.

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Auerbach (1986)	First there is an analytical part which is then complemented by a simulation.	The paper is not empirical in a strict sense.	The results are all derived from analytics and/or the simulation: Tax loss carryforwards have the risk to expire before they can be utilized and they automatically bring a timing disadvantage based on interest. A limited recognition of losses is supposed to have negative effects on investments. Existing tax loss carryforwards bring firms a situation of partial tax exemption.
Auerbach, Poterba (1987)	1,425 US corporations from the years 1981 till 1984. Some tables and figures refer to the year 1974. The paper is generally based on the Compustat database, but additional adjustments regarding tax loss carryforwards, annual reports, and 10-K-statements have been made.	Probabilities of transition from a tax loss status to a profitable status are analyzed. Detailed descriptive tables and figures are presented. The main aspect analyzed in this paper is the persistence of tax loss carryforwards.	The tax loss carryforward status is rather persistent. For each year, the probabilities of transforming from a company with/without a loss carryforward in t-1 to a company without/with a loss carryforward in t are shown. The average probability based on the years 1981 till 1984 that a loss carryforward of t-1 is still observable in t amounts to 90.9%. The paper shows for each year how long loss carryforwards persist. Regarding the losses from 1974, the probability that they persist one year is 80.1%, 43.2% that they persist three years, 22.6% that they persist five years, 15.2% that they persist seven years, and 10.5% that they persist ten years.
Barlev, Levy (1975)	The paper is not based on firm data, but focuses on tax loss treatment rules. It shows the tax loss treatment rules of several countries and calculates the probabilities of loss utilization and resulting tax savings once the loss carryforward period is limited.	The study is not strictly empirical. The identification builds on the simple truth that a loss carryforward can only be utilized for tax purposes once there is a profit in the following period. The probability of such a profit's occurrence differs. The later the loss carryforward is utilized the lower is its value.	Analysis of the difference between the loss carryback's and the loss carryforward's advantage. The expected tax savings, calculated as net present values, is shown as depending on the respective probability of loss carryforward utilizations. The three-year loss carryback in the USA causes the expected probability of tax savings there to be at a value of 95.99%, whereas in the UK and in Israel (both grant no carryback and an unlimited carryforward) it amounts to only 80%.
Buettner, Fuest (2010)	Exclusively composed IFO dataset covering German companies from the manufacturing sector. The data covers ten monthly	Descriptive figures and tables showing the share of firms reporting losses or profits in the respective months. The linear regressions use the weighted tax rate of all firms which show profits	The tax-induced stabilization effect is smaller with limited loss-offsetting as compared to if full loss-offsetting was granted. In the presence of full loss-offsetting, all credit-constrained firms benefit from the immediate offset. The value of the stabilization measure

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	waves with financial statement information and the financing restrictions as perceived by the respective firms.	and also have credit constraints. This is the so-called stability measure.	is 7.8% at limited loss-offsetting. If there was full loss-offsetting, it would amount to 11.5%.
Cooper, Boynton (2004)	Tax data of the Internal Revenue Service covering 27,000 US corporations.	Descriptive analysis concerning the loss carrybacks' liquidity effect.	The loss carryback has strong liquidity effects. The replication of this study by Graham and Kim (2009), which is based on Compustat data, leads to similar conclusions.
Cooper, Knittel (2006)	US companies observed in the years 1993 till 2003. Two datasets by the Internal Revenue Service are combined: annual balance sheet information with 80,000 to 140,000 firm observations per year and "CORTAX" data, covering information of loss carryback and insolvency applications.	Mainly descriptive: utilization/existence/expiration of tax loss carryforwards per year.	About 50% to 60% of all tax losses are used within a ten-year time window by means of a loss carryforward or a loss carryback. 10% to 20% are used outside this time window. 25% to 30% of all tax losses are never used.
Cooper, Knittel (2010)	US companies observed in the years 1993 till 2004. Two datasets by the Internal Revenue Service are combined: annual balance sheet information and "CORTAX" data, covering information of loss carryback and insolvency applications.	The first part of the paper is similar to Cooper, Knittel (2006), i.e. it is mainly descriptive: utilization/existence/expiration of tax loss carryforwards per year. The paper also shows the loss utilization per industry and the time until loss carryforwards are reduced. Moreover, firm-specific effective marginal tax rates are calculated.	Loss-offset restrictions reduce the value of loss carryforwards by about a half. It is especially young firms from the information industry and the professional services industry which are affected by the loss-offset restrictions. The effective tax rates differ strongly only if the firm is debt financed and/or receives investment grants.
Cummins, Hassett and Hubbard (1995)	US firm-level data based on Compustat, covering industrial enterprises in the years 1953 till 1988.	Linear regressions with fixed assets serving as the dependent variable and cost of capital serving as the independent variable. Additional figures show the overall trends in aggregates.	Concerning their investments in fixed assets, companies without a tax loss carryforward are more sensitive to tax rate reductions and investment incentives than those who do. The aggregate figures show that there is a negative relationship between the cost of capital and investments.

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Devereux (1989)	Panel consisting of 187 UK companies from the manufacturing sector, covering the years 1975 till 1984. The Datastream International database provides the annual financial statement information, the London Share Price Database provides the market value.	Dynamic GMM estimation approach following Arellano and Bond. The regressions are in first differences. Dependent variable: investment in t ; most important independent variable: cost of capital following King/Fullerton. The cost of capital regarding tax rates and existing tax loss carryforwards ("tax exhaustion"). Independent control variables: investment in $t-1$, turnover in t and in $t-1$, market value.	The paper shows the results of only three regression setups. In two of them, the cost of capital negatively influences investment. The investment impact of corporate taxes or even of present loss carryforwards is not isolated.
Devereux, Fuest (2009)	Selection of the UK companies listed in the Datastream database. 10,239 observations stemming from 537 firms and starting in 1980. Furthermore, there is quarterly data since 1980 from the "CIB Industrial Trends Survey". In this survey, firms state to what extent they expect financing constraints in the upcoming 12 months.	The stability measure differs according to the difficulty of refinancing and by the profit or loss situation. Descriptive figures and tables show the size of the stability measure of firms with positive or negative tax payments and its size for the hypothetical case that losses could always be offset immediately. The paper presents several further descriptive statistics.	Most of the firms facing problems of refinancing are in a loss situation. For such firms, the corporate income tax cannot exert a stabilizing effect, because they do not receive any financing means from the state. A more generous, i.e. faster, loss offsetting would significantly increase the stabilization effect.
Devereux, Keen, Schiantarelli (1994)	Panel data of 591 UK firms from the manufacturing industry, observed in the years 1973 till 1986. The estimations are based on 4,778 firm observations.	Dynamic GMM panel estimations following Arellano and Bond. Regressions are in first differences. Two different models are applied, namely an Euler-equation and a Q-equation. The paper traces the influence of cost of capital on investments. In doing so, it builds on four models, which one by one cover the asymmetric tax recognition of profits and losses, not at all at first and then on a more and more detailed level.	Other than theoretically expected, the careful consideration of asymmetric taxation does not increase the quality in investment forecasts. This means that the specific tax rules would be irrelevant. Possible explanations listed in the paper are the following: UK microdata do not show enough variation, there might be an omitted variable bias, tax regulations and investment might be endogenous, and/or there are arbitrage opportunities (e.g. via leasing).

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Devereux, Loretz (2008)	ORBIS database by Bureau van Dijk. Unbalanced panel of worldwide subsidiaries belonging to groups of companies, covering the years 2001 till 2005.	The effective tax rates by Devereux/Griffith (1999) are advanced in such a way that they also consider losses and their offset in an international group. First, the group structure is identified in the dataset. Then, firm-specific effective average tax rates are computed. Additional descriptive figures and statistics show the EATR distribution per country and tax system.	For each country, the firm-specific EATR is compared between the current system, a system of international consolidation/loss-offsetting, and a formula-apportionment-system. Due to new tax planning opportunities, international consolidation is supposed to even further deteriorate capital export neutrality and ownership neutrality.
Donnelly, Young (2002)	Tax loss-offsetting rules in OECD countries in the year 2011. Very detailed comparative tax law analysis between USA, Canada and Australia.	The paper is not strictly empirical.	Demand for a group taxation regime in Canada. As of 2012, Canada has not yet introduced such a regime for the netting of profits and losses between subsidiaries of the same group.
Dwenger (2008)	Corporate income tax statistics of the German Federal Statistical Office.	A microsimulation model is applied to increase the loss offset prognosis. The majority of the paper, however, remains descriptive.	As of 2001, the average loss carryforward per firm amounted to about EUR 500,000. On the aggregate across all firms, this meant a total of loss carryforwards of EUR 388 billion in 2001. Losses are by far more often offset by means of a loss carryforward than by means of a loss carryback. Since 1992, the utilization of tax losses has strongly increased. About one quarter (EUR 100 billion) of such carryforwards can be found in the private service sector and one eighth each (EUR 50 billion) can be found in the real estate industry, in the consumer goods industry, and in the manufacturing industry.
Dwenger, Walch (2011)	Two data sets are merged. First, the investment and cost structure surveys of the years 1995 till 2004 by the Research Data Center of the Statistical Offices of the Federation and the German federal states. Second, the corporate income tax statistics of the years 2001 and 2004.	Investigation of the tax impact on investment. The usage of tax data and especially the recognition of the tax status, i.e. the profit and loss situation, are emphasized. After some descriptive statistics, the paper presents the results of distributed lag models based on OLS and system GMM estimations.	Accounting for tax losses is supposed to yield a more precise point-estimate for the user cost elasticity of investment. The elasticity of capital with respect to its user cost, estimated with System GMM yields -0.52. That is, an increase in the user cost of capital of 1% reduces corporate investment by 0.52%.

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Edgerton (2010)	Panel data of US firms from the Compustat North America database, covering the years 1967 till 2005.	Ordinary least squares estimations with investments/capital stock serving as the dependent variable. The most important independent variable is the interaction term between the loss carryforward dummy ("nontaxable"=1, "taxable"=0) and the effective tax rate. The interaction term is negative, but loses its significance once additional cash flow variables are included in the estimation.	Accelerated bonus depreciations offered by the US government could not be used by firms with existing loss carryforwards. As a consequence, the measure was 4% less effective as compared to the case where all firms had been subject to tax. Low cash flows at times of economic crises further decrease the effect of bonus depreciations by 24% as compared to the hypothetical case that the all-time average cash flow would apply. When simultaneously analyzing the cash flow effect and the effect of an existing loss carryforward, the latter is insignificant.
Fochmann, Kiesewetter, Sadrieh (2012)	Laboratory experiment with 91 student participants.	First, the investment behavior in the no-tax baseline case is compared to a setting where the income resulting from investments is taxed. In a second step, the baseline investment choices are compared to choices under three types of income taxation. In three, the after-tax outcomes of prospects are identical.	First, investors significantly reduce their risk-taking as predicted by theory. Second, investors seem to have a positively biased perception of loss-deduction provisions. This second conclusion is derived from the observation that while partial and capped loss-deduction increase risk-taking significantly, a tax system without loss-deduction does not significantly alter risk-taking.
Gendron, Anderson, Mintz (2003)	Balanced panel originating from the Compustat database and tracing 50 Canadian firms of the manufacturing sector. These firms are traced over a time span of 19 years, from 1976 till 1994.	At first, a Poisson count variable estimator is applied. The dependent variable is the number of years a firm has a loss carryforward available. The most important independent variable is the capital cost allowance. In the second half of the paper, there is a switching model analyzing the firms' long term demand for capital.	The existence of a loss carryforward has an effect on the taking up of capital. The paper, however, does not clearly point out the size of this effect and it also does not put forward what is expected.
Gordon, MacKie-Mason (1997)	Tax data of the Internal Revenue Service tracing US companies from 1959 till 1986.	Three estimation approaches: OLS, IV and IV with a lagged variable. The dependent variable is the share of assets held in form of C-corporations in all assets. The most important independent variable is the tax price, i.e. the amount by which a	The major focus lies on the choice of the organizational form (C-corporation vs. S-corporation). Firms with losses tend to opt for a C-corporation, whereas firms with profits tend to opt for an S-corporation. Following the line of argumentation of this paper, loss-making firms favor the higher taxation of the C-corporation's

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		C-corporation is taxed higher than an S-corporation.	organizational form.
Graham, Kim (2009)	Compustat quarterly data of US companies, covering the years 2008 and 2009.	Detailed descriptive analyses showing the following aspects: the amount of loss carrybacks and the number of previous years they are applied to (table 1), liquidity effects from the switch from a two-year to a five-year carryback, differencing by industry (table 5), and the effect on effective marginal tax rates (table 7)	The actual two-year loss carryback is contrasted with a hypothetical five-year carryback. The extension to five years would have brought US firms additional liquidity in the amount of USD 19 billion in 2008 and USD 34 billion in 2009. The extension would have been particularly beneficial to the real estate, the automobile and the financial industry.
Jacob, Pasedag, Wagner (2011)	Tax loss treatment rules and tax rates of the year 2010.	Descriptive: Tax loss treatment rules and tax rates. Additionally, there are some linear regressions. There, the dependent variable is the respective present value of the tax loss, which differs depending on the offsetting rule. The most important independent variable is the tax rate. Correlation tables provide further insights into the general trends and relationships.	Those countries with the lowest overall tax rates, based on withholding taxes on dividends, the corporate income tax and the business tax, seem to have the most restrictive loss-offsetting regulations. Thus, the tax rate effect on the loss' net present value is positive and significant. When only focusing on the corporate income tax rates, this impact cannot be identified clearly.
Mintz (1988)	Data of Canadian companies, aggregated on the industry level, covering the years 1979 till 1981.	Tax loss-offset limitations are translated into respectively implemented effective tax rates. Differentiation by industry (7 categories) and by three company types (subject to tax, tax-free, startup).	The required adjustments of the effective tax rates show that it is especially startup companies which suffer from the tax loss-offset restrictions. They face the problem that beneficial accelerated bonus depreciations and deductions cannot be taken advantage of. High tax-loss carryforwards reduce the effective tax rate on current profits.

5. Empirical Evaluation of Interest Barrier Effects^{40 41}

Abstract:

I analyze the impact of changes in thin capitalization rules on corporations' capital structure. Thin capitalization rules prevent firms from deducting excessive interest expenses from their tax base. As of 2008, Germany has severely changed its thin capitalization rule by targeting interest payments instead of debt to equity ratios. The new rule has primarily been introduced to prohibit tax avoidance by multinationals. For reasons of non-discrimination, the rule is, however, equally attributable on the national level and it is applicable to both internal and external financing. The theoretical and analytical literature has brought forward many arguments stating that the new interest barrier is harmful to firms, distorting their financing decisions. Four years after its introduction, the time has come to empirically evaluate the interest barrier. The DAFNE database serves as my source of reference. I differentiate by firm characteristics, by industry and by kind of debt. I find that the interest barrier drove firms to lower their debt to assets ratios and their net interest payments. Opposing its original intention, it was, however, also the national firms which adjusted their capital structure, and it was external rather than internal debt which was reduced. Thus, the interest barrier does indeed affect financing decisions, but predominantly not in the intended way and not of the intended firms. In sensitivity analyses I examine highly leveraged and low profitable firms, which are likely to be subject to the interest barrier. The results suggest a debt-reducing interest barrier effect for these companies as well.

Keywords: Capital Structure, Corporate Taxation, Interest Barrier, Empirical Analysis, Firm-Level Data

JEL-Classification: F23, H25, H32

⁴⁰ This paper is joint work with Uwe Scheuering. In July 2012, it has been published as ZEW Discussion Paper 12-046. As of autumn 2012, it is under review for the journal *Public Finance Analysis*. In 2012, the paper has been presented at the empirical tax and accounting PhD research seminar at the University of Mannheim and at an Empirical Tax Research conference in Mannheim.

⁴¹ I thank Holger Daske and Johannes Voget for helpful comments. Financial support by the German Science Foundation (DFG) is gratefully acknowledged.

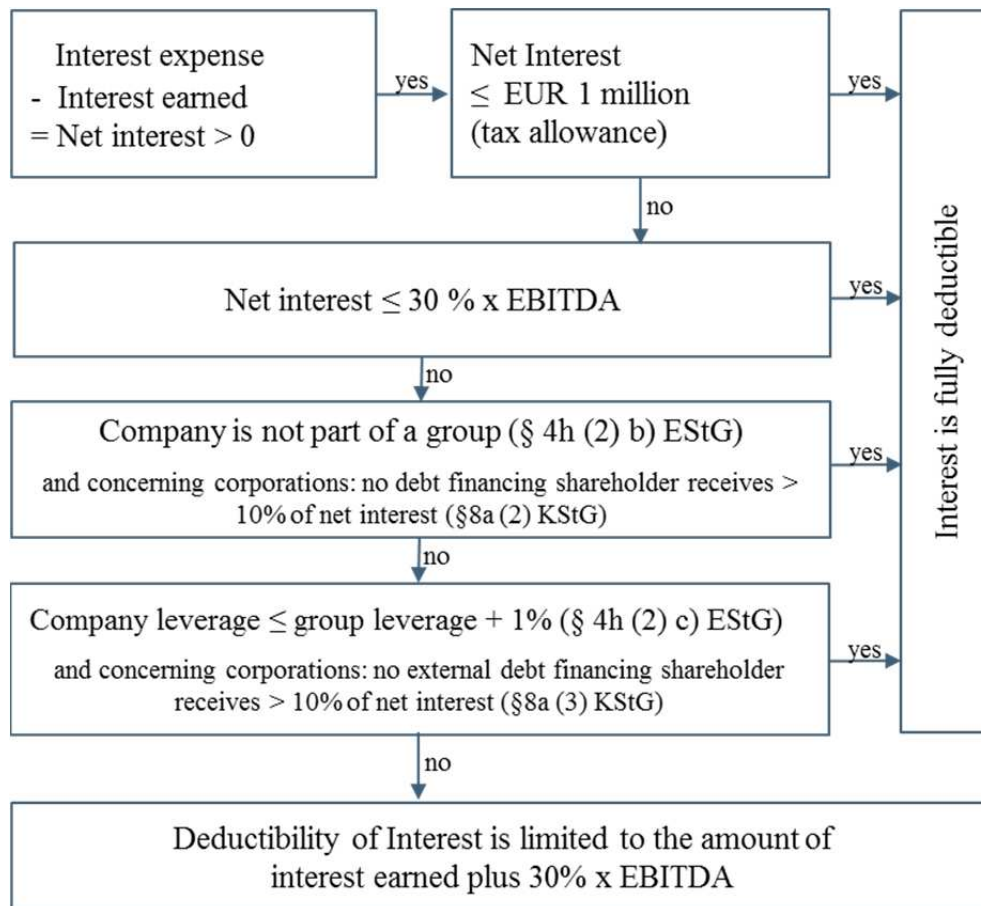
5.1 Introduction

Not without a lack of irony, Homburg (2007) calls the interest barrier an unprecedented tax innovation. Even before its introduction in 2008, the German interest barrier had a very poor scientific reputation. Based on analytical considerations, it is supposed to distort financing decisions, thus harming production efficiency. It is said to drive into bankruptcy even those firms which have no intentions of abusive tax evasion whatsoever. According to Homburg (2007), the German interest barrier combines maximal economic damage with minimal fiscal utility. The numerous critical articles on the German regulation did, however, not prevent Italy from introducing a very similar rule in the same year 2008.

Thin capitalization rules prevent firms from deducting interest from their tax base if certain conditions are met. Before 2008, the amount of (non-)deductible interest was determined by a firm's debt to equity ratio. The interest on internal debt going beyond 1.5 times the equity of the respective shareholder was not deductible. As of 2008, the deductibility of interest no longer depended on the ratio, but on interest payments. Generally speaking, interest payments exceeding the interest earnings are only deductible at the amount of 30% of EBITDA once the exemption limit of an initial EUR 1 million is exceeded. The new interest barrier rule covers all sources of interest and, unlike the previous rule, not only internal but also external debt. It has primarily been introduced to prohibit tax avoidance by multinationals. For reasons of non-discrimination, the rule is equally attributable on the national level. Non-deductible interest is recorded in an interest carryforward. Figure 5-1 below illustrates the functioning of the new interest barrier.

Homburg (2007) is not the only - convincing - analytical paper which severely criticizes the interest barrier. Blaufus and Lorenz (2009), Bolik, Fuest and Ortmann-Babel (2010), Eilers (2007), Endres (2007), Herzig and Bohn (2007), Hey (2007), Musil and Volmering (2008), Stangl and Rödder (2007), Töben (2007), and Welling (2007) draw similarly negative conclusions. German politicians have reacted to this critique by slightly relaxing the interest barrier in 2009, when they retroactively increased the exemption amount from EUR 1 million to EUR 3 million and also enlarged the tolerance range of the so-called escape clause, comparing the firm's leverage to the group's leverage.

Four years after its introduction, the time has come to empirically evaluate the interest barrier. Affected firms might either be struck by the interest barrier or might have taken evasive actions. My empirical estimations are based on Bureau van Dijk's DAFNE database, which is

Figure 5-1: Interest barrier - legal scheme

Cf. Winkeljohann and Fuhrmann (2007). As of 2009, the tax allowance was increased to EUR 3 million and the company leverage could exceed the group leverage by 2%.

a detailed subgroup of the Amadeus database covering German companies. I differentiate by firm characteristics, by industry and by different kinds of debt. I find that the interest barrier made firms lower their debt to assets ratios. Opposing its original intention, it was, however, also the national firms which adjusted their capital structure. In robustness checks, I find interest barrier effects for highly leveraged firms and for companies with a low profitability.

The remainder of the paper is organized as follows. In the next section I present a literature review. Thereafter, the effects of the thin capitalization legislation are worked out analytically in Section 3. This serves as the basis for my development of hypotheses in Section 4. Descriptive statistics are provided in Section 5, followed by the empirical approach in Section 6 and results in Section 7. Finally, Section 8 concludes.

5.2 Literature Review

Ever since Modigliani and Miller (1958, 1963) published their theory of the capital structure of a firm, the tax advantage of debt financing in contrast to equity financing has been widely discussed in the literature. Modigliani and Miller argue that debt financing is more advantageous than equity financing since interest expenses are tax deductible. However, they also highlight that there are a lot of non-tax reasons influencing the optimal financing decision. As a result, they reject the idea that 100% debt financing is usually the best choice. Further analytical research strengthened this position and revealed that it might not always be beneficial to finance corporate undertakings with debt. Myers (1977) for example, argues that an already existing asset stock should rather be financed with a higher percentage of debt compared to new growth opportunities.

Following the analytical approaches, multiple authors tried to show these effects empirically. MacKie-Mason (1990) as well as Graham (1999) find positive effects of corporate tax rates on leverage by focusing on data about primary seasoned offerings. Gordon and Lee (2001 and 2007) reveal a much larger effect that is particularly strong for small and for very large firms but not for medium-sized firms. Additionally, Desai, Foley and Hines (2004) can show that the effect varies with the source of debt. Their study on U.S. firms yields a higher responsiveness to tax-rate differences of internal debt compared to external debt. Huizinga, Laeven and Nicodème (2008) also provide support for the international debt and profit shifting of multinationals. The corporate tax rate effect on financing decisions has been summarized in a literature review by Graham (2003) and in a meta study by Feld, Heckemeyer and Overesch (2011).

Rajan and Zingales (1995), Graham (1999), Alworth and Arachi (2001) and Overesch and Voeller (2010) do not only focus on the positive effect of corporate tax rates on the debt level, but also try to identify a proposed negative effect of high personal taxes on interest.⁴² Each of these studies is based on a different dataset and covers an international context. All of them clearly identify the proposed negative effect.

However, there are also studies that fail to identify either of the above mentioned effects or that stress other effects as relatively more important. Taub (1975) for example, finds a

⁴² Miller (1977) argues that, at the margin, a negative effect of personal taxation might negate the corporate tax advantage of debt financing, because most tax systems favor dividend income to interest income. De Angelo and Masulis (1980) implement an interior leverage equilibrium model considering the interaction of corporate and personal taxes.

counterintuitive negative effect of higher corporate tax rates on debt financing. Myers (1984) postulates that the past literature provided no convincing evidence on corporate taxes increasing the leverage. Lemmon, Roberts and Zender (2008) find that firm-specific leverage remains constant over a very long period of time, i.e. more than 20 years, concluding that the majority of variation in capital structure is time-invariant and that much of this variation is unaccounted for by existing empirical specifications.

When it comes to the financial effects of tax policy, one may wonder whether the measures to counter the effects described above were successful. Haufler and Runkel (2008), Weichenrieder and Windischbauer (2008) as well as Buettner, Overesch, Schreiber and Wamser (2008) all focus on the question of whether thin capitalization rules result in a reduction of internal debt and whether this increases fiscal revenues. Wamser (2008) focuses on the introduction of the German thin capitalization rule in 1994 and its amendments in 2001 and 2004. All of these empirical studies find evidence on a significant reduction of internal debt following the introduction of a thin capitalization rule. However, they do not show that this reduction also resulted in a reduction of overall debt. They rather suggest that internal debt was substituted with external debt resulting in no increase in tax revenues.

As mentioned in the introduction, the emergence of the German interest barrier rule in 2007 was predominantly criticized in the German tax literature for being too far-reaching. Three elements of the interest barrier rule are heavily criticized. First of all, the rule is said to overshoot the mark because not only internal but also external debt financing is limited (cf. Hey (2007), Homburg (2007)). Second, the interest barrier rule is seen as being harmful, especially to companies in financial distress. It is argued that the interest barrier rule can result in high taxation for highly leveraged companies having low earnings. It might force companies which are in a loss situation before consideration of the rule into paying taxes, thus making their situations even worse. The interest barrier is therefore seen as reinforcing a crisis (cf. Endres (2007), Grotherr (2008), Herzig and Bohn (2007), Hey (2007), Köhler (2007), Schwarz (2008)). Third, the so-called escape-clause is heavily criticized. It allows companies to escape the interest barrier rule if they can prove that the German company does not deviate from the equity-quota of the group, i.e. that the German business is not highly leveraged compared to the overall group. Dörfler and Vogl (2007), Endres (2007), Ganssauge and Mattern (2008), Grotherr (2008), Thiel (2007) and Welling (2007), however, see this equity test as highly complex and as bearing high administrative costs. Focusing on legal aspects,

Führich (2007), Hornig (2007) and Musil and Volmering (2008) argue that the interest barrier rule does not comply with EU-law and the German constitution.

Empirical enquiries of the interest barrier rule in Germany have, so far, mainly focused on two aspects. Bolik, Fuest and Ortmann-Babel (2010) as well as Herzig, Lochmann and Liekenbrock (2008) asked companies about their perception of the interest barrier rule and whether they are being harmed by it. Bolik, Fuest and Ortmann-Babel (2010) show that most companies conceptually reject the rule and the newly-introduced loss carryforward restrictions, and that companies expect a higher tax burden as a result of the new interest barrier rule. Herzig, Lochmann and Liekenbrock (2008) show that 43% of the companies expect to be harmed by the rule. The second aspect that has been traced empirically is which companies will be harmed by the rule. Though the expected numbers differ between 150 and 1511 companies, Bach and Buslei (2009) as well as Blaufus and Lorenz (2009) expect the rule to be particularly harmful to large companies.

Even when the rule was adjusted in 2009, criticism continued. Rödding (2009) and Lenz, Doerfler and Adrian (2010) argue that the equity-quota computation is still problematic and demand the conversion of the newly increased exemption limit of EUR 3 million into a tax allowance. Additionally, Herzig and Liekenbrock (2010) stress problems with the *EBITDA*-carryover.

5.3 General Analytics

Firms might lower their debt to assets ratios if the advantage of debt financing decreases. I illustrate this by comparing the net present value of a debt financed and an equity financed investment.

If the investor provides equity to the firm, the net present value of the investment is given by

$$NPV_E = EX_0 + \frac{(I_t - EX_t - DEP_t)(1 - \tau_c)(1 - \tau_s)}{[1 + i(1 - \tau_i)]^t}, \quad (5-1)$$

where EX_0 is the amount of investment, I_t and EX_t are the income and expenses in period t , DEP_t is the amount of depreciation, i is the interest rate, and τ_c and τ_s are the tax rates for

corporate profits on the firm and shareholder level. τ_i is the tax rate on interest earnings. If the investor instead chooses to provide capital in the form of debt, the net present value is

$$NPV_D = NPV_E + \sum_{t=1}^n \frac{(\gamma INT_t)(1 - \tau_s)\tau_c + INT_t(\tau_s - \tau_i)}{[1 + i(1 - \tau_i)]^t}, \quad (5-2)$$

where INT_t are interest expenses for debt provided by the investor and $0 < \gamma < 1$ is the fraction of interest payments that is deductible from the corporate tax base.⁴³ γ equals 1 if no thin capitalization rules exist, but is < 1 if the company is affected by the interest barrier, for example. As the deductibility of interest payments leads to a lower taxation than in the equity financed investment where dividends are not tax-deductible, I see in equation (2) that the net present value of a debt financed investment is always greater than the net present value of an equity financed investment as long as some interest expenses are deductible from the corporate tax base, in particular as long as $\gamma > [\tau_i - \tau_s]/[(1 - \tau_s)\tau_c]$. This means that firms generally have a tax-induced incentive to use debt rather than equity as a means of financing. This result was first developed by Modigliani and Miller (1963). Opposing this tax advantage of debt financing, there are other determinants of the capital structure choice like legal constraints, risk considerations and the availability of debt, leading to the fact that I do not exclusively observe debt financed investments. The optimal fraction of debt, however, is supposed to be positively affected by the tax advantage. I am particularly interested in the effect of γ . Equation (5-2) shows that the tax advantage of debt increases in γ . Thus, assuming that the introduction of the interest barrier in Germany in 2008 leads to a decrease of γ , the relative advantage of debt financing over equity financing decreases and therefore the application of debt in the years after the reform is generally supposed to decrease.

To find out for which firms the new interest barrier is more restrictive than the old debt to assets rule with its 1.5 internal debt to equity safe haven, I compare the interest expenses that are non-deductible under both rules on a company level. I first take a look at the old rule. The non-deductible interest expenses (*NDI*) are given by

⁴³ This result comes from

$$NPV_D = EX_0 + \sum_{t=1}^n \frac{[(I_t - EX_t - DEP_t - \gamma INT_t)(1 - \tau_c) - (1 - \gamma)INT_t](1 - \tau_s) + INT_t(1 - \tau_i)}{[1 + i(1 - \tau_i)]^t},$$

where only $\gamma \cdot INT_t$ are deductible from the corporate tax base and $(1 - \gamma) INT_t$, the part that is not deductible, is only deducted from the personal tax base. In addition, the interest payments received by the investor are fully taxed on the personal level.

5. Empirical Evaluation of Interest Barrier Effects

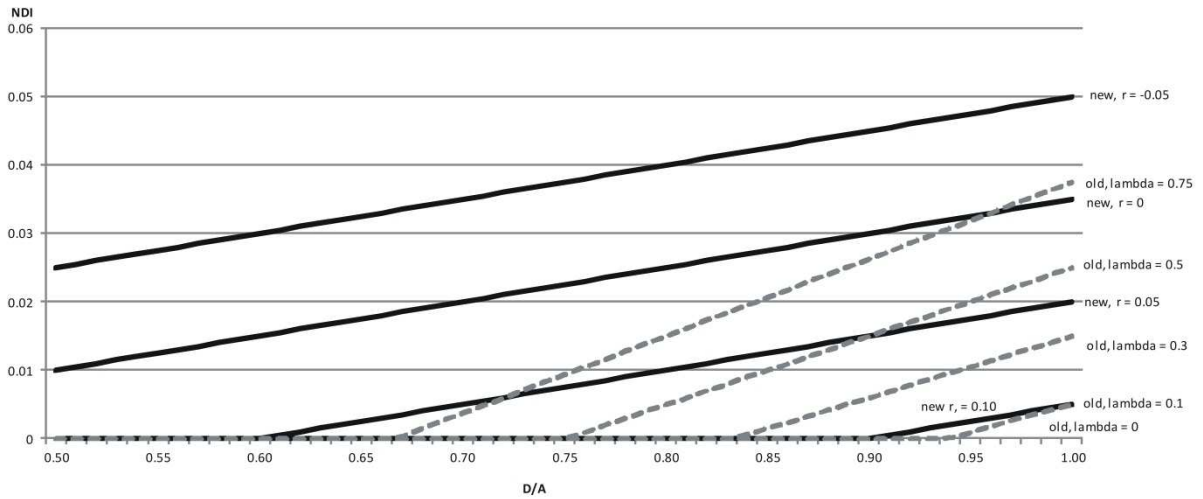
$$NDI_{old} := \begin{cases} \left(1 - \frac{1.5}{\lambda D/E}\right) i \lambda D, & \text{if } > 0 \\ 0, & \text{otherwise,} \end{cases} \quad (5-3)$$

where i is the interest rate payable for debt, E is the equity of the considered company and λ is the fraction of total debt that is labeled as internal debt. As a result, the term in parantheses is the fraction of internal debt for which interest expenses are non-deductible under the old rule. Under the new rule, the amount of non-deductible interest is

$$NDI_{new} := \begin{cases} i (D - V) - 0.3 \cdot EBITDA, & \text{if } > 0 \\ 0, & \text{otherwise,} \end{cases} \quad (5-4)$$

Here, V are the lendings of the company given to other parties and $EBITDA$ are the earnings before interest and depreciation which is the sum of earnings before interest, $EBIT$, and the amount of depreciation in the considered period, DEP .⁴⁴ In Figure 5-2 I show the non-deductible interest expenses as a percentage of total assets under the old (dashed lines) and the new rule (solid lines) as a function of the debt to assets ratio D/A .⁴⁵ I see that the slope of NDI_{old} is higher than the one of NDI_{new} .

Figure 5-2: NDI_{old} and NDI_{new} as functions of D/A for different λ s and r s



Dashed lines are non-deductible interest payments (NDI) in per cent of total assets under the old rule and solid lines are non-deductible interest payments in per cent of total assets under the new rule.

⁴⁴ I do not mention the exemptions of the new rule in this analytical part for the sake of simplicity. In addition, I assume that the interest rate is the same for both borrowing and lending.

⁴⁵ $V=0$ and the ratio of depreciation to total assets $DEP/A=0.05$ in this example.

For given values of the profitability r , which is defined as $EBIT$ divided by total assets and determines NDI_{new} and for λ , determining NDI_{old} , I sometimes find an intersection of both lines. From this critical value for the debt to assets ratio onwards, the old rule leads to a higher amount of non-deductible expenses than the new rule. This is the case where r and λ are relatively high, meaning profitable firms with lots of internal debt. For firms with a lower profitability which mainly have external debt in their balance sheet, NDI_{new} is likely to be higher than NDI_{old} . The analytical form for this critical value of the debt to assets ratio for which both rules lead to the same amount of non-deductible interest expenses is given by

$$NDI_{new} \geq NDI_{old}$$

$$\Leftrightarrow \frac{D}{A} \begin{cases} \leq \frac{1.5 - \frac{V}{A} + 0.3 \left(\frac{\tau}{i} + \frac{DEP}{A \cdot i} \right)}{\lambda + 0.5 - 1}, & \text{if } NDI_{old} > 0 \\ \leq \frac{V}{A} + 0.3 \left(\frac{\tau}{i} + \frac{DEP}{A \cdot i} \right), & \text{if } NDI_{old} = 0 \end{cases} \quad (5-5)$$

If all interest expenses are deductible under the old rule, the debt to assets ratio, from which $NDI_{new} > 0$, increases in profitability, the lending-fraction and the depreciation-fraction of assets. In addition, it decreases in the interest rate. If the old rule also restricts interest deductibility, the new rule is stricter than the old one if the debt to assets ratio is below a critical value depending on the same variables and, in addition, on λ . Solving for r leads to

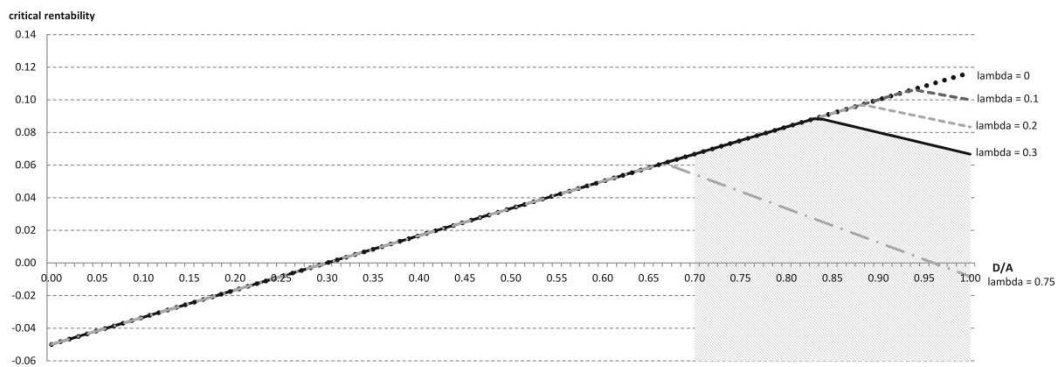
$$NDI_{new} \geq NDI_{old}$$

$$\Leftrightarrow r \leq \begin{cases} \frac{i}{0.3} \left[(1 - \lambda - 1.5) \frac{D}{A} - \frac{V}{A} + 1.5 \right] - \frac{DEP}{A}, & \text{if } NDI_{old} > 0 \\ \frac{i}{0.3} \left[\frac{D}{A} - \frac{V}{A} \right] - \frac{DEP}{A}, & \text{if } NDI_{old} = 0 \end{cases} \quad (5-6)$$

If the old rule does not restrict interest deductibility, the critical value for r increases in the debt to assets ratio and the interest rate. In addition, it decreases in the lending-fraction and depreciation-fraction of assets. This is because the interest barrier rule looks at net interest expenses and compares them to earnings before depreciation. If some interest expenses are non-deductible under the old rule, the critical value for r also depends on the fraction of internal debt λ . Then, it decreases in D/A if λ is fixed. Figure 5-3 shows the run of the critical-

r -curve as a function of D/A for different λ s.⁴⁶ If $\lambda = 0$, all interest expenses are deductible under the old rule because it only triggered internal debt. The result is a strictly increasing critical value of r in D/A . If $\lambda > 0$, the curve forms a kink. For $\lambda = 0.3$, for example, the critical value for r is the same for $D/A = 0.7$ and $D/A = 1.0$ and equals 0.067. This means the difference of NDI_{new} and NDI_{old} is the same for the two debt to assets ratios and $r = 0.067$. The difference between these two points is that $NDI_{new} = NDI_{old} = 0$ if $D/A = 0.7$ and $NDI_{new} = NDI_{old} > 0$ if $D/A = 1.0$. I can summarize by saying that, in my example, the new rule denies more interest expenses to be deductible than the old rule if D/A is between 0.7 and 1.0 and the profitability is lower than 6.7%, i.e. if the company is located in the grey area under the r -curve. Descriptive statistics for D/A , r , λ and DEP/A are shown in Table 5-3 of Section 5.

Figure 5-3: Critical rentability as function of D/A for different λ s



I can conclude that only specific firms are supposed to suffer more from the new interest barrier than from the old debt to equity rule. As I can see in Figures 2 and 3 the interest barrier is especially harmful for firms with a low profitability whereas firms with an average profitability are likely to remain unaffected by the reform or even benefit from the new rule. This corresponds to findings of Blaufus and Lorenz (2009). In addition, the old rule was more harmful for firms having a high fraction of internal debt to total debt. Therefore, in my empirical analysis, I divide the dataset into different groups of firms comparing their respective reactions after the reform.

⁴⁶ $V/A=0$ and $AFA/A= 0.05$ in this example.

5.4 Development of Hypotheses

When the new interest barrier was introduced in 2008, the German legislator first and foremost aimed at one specific goal: putting an end to the tax-induced abusive internal cross-border lending of multinational companies.⁴⁷ In order to avoid conflicts with the European Court of Justice, however, the new anti-avoidance rule could not specifically target multinationals, but had to treat cross-border lending and purely national lending in the same way. As shown above, the interest barrier differentiates neither by the number of countries involved, nor whether internal or external debt is at hand. Thus, companies can neither avoid the rule by expanding or concentrating their business nor by switching between external and internal lending.

The actions which can actually be taken by companies in order to avoid unfavorable consequences of the interest barrier lead to results very much in line with the intention of the legislator. A company can cut the leverage in the high tax country, it can grant more loans in order to increase its interest earnings or it can aim at achieving a higher *EBITDA* without adjusting its leverage. All of these measures taken by a company generate and secure the tax base in the high tax country applying the interest barrier. In this paper I aim at analyzing whether the companies affected by the new interest barrier in Germany lowered their leverage. Even though I carry out an empirical analysis on the micro level, my approach also allows for conclusions regarding to what extent the legislator reached its goals and to what extent it caused collateral damage by influencing and punishing companies he did not genuinely aim at.

The basic technical idea behind my identification method is the following: I identify firms which would have been affected by the new interest barrier if it had already been in place in the years 2005 to 2007, i.e. before its actual coming into force in 2008. Then I analyze empirically how these firms adjusted their debt to assets ratios as compared to the control group. It is a necessity to split the treatment group from the control group based on their characteristics *before* the introduction of the interest barrier, because the information after it already comprehends the firms' reactions.

My very first hypothesis is very general. It builds on the assumption that firms try to avoid non-deductible interest. Even though non-deductible interest is recorded in an interest carryforward, its existence does not decisively influence the hypothesis. As compared to an

⁴⁷ Cf. the official justification for the interest barrier, BR-Drucks. 220/07 (2007), p. 53.

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immediate deduction, the carryforward brings a net present value disadvantage and its applicability is uncertain, especially for struggling firms. Once the interest barrier has come into force, companies can calculate to what extent they are negatively affected by the legislation and adjust their capital structure accordingly. Firms arriving at the conclusion that they are not affected by the interest barrier, by contrast, have no particular reason to adjust their leverage. These firms serve as the control group. Of course, there are other effects influencing the optimal leverage such as the decline of the corporate tax rate or macroeconomic criteria influencing the interest rate.⁴⁸ Given that such effects are the same to both of the analyzed groups, they do not prevent the sound identification of an interest barrier effect. Thus, I state hypothesis H5-1:

H5-1: After the introduction of the new interest barrier, the hypothetically ex ante hit firms lowered their leverage. This holds especially true concerning firms which are more severely affected by the new interest barrier than by the previous rule.

The interest barrier was set up to prohibit legal but unpleasant tax avoidance by multinational firms. The provision of loans from subsidiaries in low-tax countries such as Ireland to company units in high-tax countries such as Germany should be prevented. Interest is taxed where it is received but reduces the tax base in the high-tax country. If multinationals actually set up such financial structures with the primary intention of saving taxes, they should easily be able to adjust them if necessary. Based on this rationale, even though the interest barrier does not explicitly distinguish between multinational and national lending, the cross-border constructions can be expected to be more elastic. Put differently, stronger adjustments of the capital structure can be expected by multinational firms because the - repealed - tax advantage was one of their primary reasons for the high leverage. National firms, by contrast, might very well have other predominant reasons for using debt such as the sheer absence of alternatives to external financing. Regardless of their desire to lower their leverage once the interest barrier is in place, these national firms might not, or at least only to a lower extent, be able to do so. Therefore, my second hypothesis is the following:

H5-2: After the introduction of the new interest barrier, companies belonging to multinational groups lowered their leverage more strongly.

When companies decide to apply debt financing, they still have a choice between internal debt and external debt. While internal debt stems from shareholders or other members of the

⁴⁸ As of 2008, for example, the German corporate income tax rate was lowered from 25% to 15%.

group, external debt is provided by banks or similar lenders. The effect of the interest barrier introduction might very well differ between these two kinds of debt financing. The interest barrier first and foremost targets tax-abusive internal debt financing. In order to prevent evasive constructions it does, however, not distinguish between interest from internal or external debt. Before the new interest barrier came into force in 2008, only internal debt was relevant for the calculation of the debt to equity ratio. Therefore, external debt has become less attractive with the introduction of the new interest barrier. Given that external debt was previously hardly relevant, in the course of the interest barrier introduction I should see a relatively stronger reduction in external rather than in internal debt. Thus, I state my third hypothesis:

H5-3: After the introduction of the new interest barrier, companies reduced more strongly their external debt than their internal debt.

Some debt financing is permissible. The new interest barrier accounts for this by granting a basic tax allowance and by admitting the deductibility of interest expenses to the amount of interest earned plus 30% of *EBITDA*. By introducing the interest barrier, the legislator did not aim at generally prohibiting debt financing, but at preventing excessive tax-induced leveraging. With my fourth hypothesis, I investigate to what extent especially those firms targeted by the new interest barrier actually reduced their debt to assets ratio. The logic behind my hypothesis is not that such highly leveraged firms reduce their debt because they are eager to fulfill the wish of the legislator; rather they are supposed to adjust it because they are the ones which are most severely hit by the new interest barrier. Given that I refer to the total leverage in this hypothesis and given that most of the debt in my data is external debt, the treatment group is generally more negatively affected by the new interest barrier than by the previous thin capitalization rule. It is therefore likely to adjust its financial structure. Thus, I suppose in my fourth hypothesis:

H5-4: After the introduction of the new interest barrier, especially the 5% most highly leveraged companies reduced their debt to assets ratios.

In Section 3, I have analytically worked out that firms with a rather low profitability are more likely to be affected by the new interest barrier than profitable firms. As could be seen above, the lower a firm's profitability, the more adverse is the new interest barrier as compared to the previous thin capitalization rule. Those firms facing a more severe rule than in the past, i.e. for which debt has become less attractive than before, are the ones which are most likely

supposed to lower their leverage. In line with Blaufus and Lorenz (2009), companies with average or even above-average profitability, however, are not negatively affected by the interest barrier rule. When focusing solely on the effect of the new legislation in the form of the interest barrier, I can state the following hypothesis:

H5-5: After the introduction of the new interest barrier, especially the 5% least profitable companies reduced their debt to assets ratios.

5.5 Data and Descriptive Statistics

I look at the development of the debt to assets ratios and the net interest payments to assets ratios of 25,751 German corporations between 2005 and 2010 in an unbalanced panel. My analysis considers all debt, internal debt and external debt one by one. In order to analyze the effects of the introduction of the interest barrier I put firms into different groups according to their non-deductible interest payments concerning the old and the new rule, according to their leverage and according to their profitability. I further control for the firms' tangibility, profitability, former losses and the number of employees. All these data are provided by the DAFNE-database by Bureau van Dijk, a subsample of the AMADEUS-database containing detailed information of German companies needed to compute the non-deductible expenses. I use information from unconsolidated statements for all corporations with total assets of more than EUR 1 million, hence concentrating on medium-sized and large firms. I drop firms with implausible values for equity, total assets, tangible assets, *EBIT*, *EBITDA*, liabilities, profitability, tangibility and interest payments. For the purpose of my analysis, I exclude firms operating in the agricultural, mining and finance sector. In addition, I use statutory corporate tax rates to control for tax rate effects on the companies' leverage. Table 5-1 defines all variables used in my regression analysis. Table 5-2 shows frequencies and absolute numbers of firms in different groups. In my sample, 487 companies, i.e. 1.89% of all companies, would have been treated by the new interest barrier in all three years before the introduction if it had been applicable since 2005. For 345 firms, i.e. 4.38% of the applicable companies, the new rule would have been more harmful than the old rule.⁴⁹ In addition, Table 5-3 provides summary statistics of the applied variables.

⁴⁹ The sample for computing if the new rule is more harmful than the old one is a bit smaller because I need additional information about the internal leverage. $4.38\% = 345/7,878$, cf. Table 5-4 for the sample size.

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Table 5-1: Variable definitions

<i>debt to assets</i>	total debt divided by total assets, measured in percentage-points (0.01 = one percent)
<i>internal debt to assets</i>	internal debt divided by total assets, measured in percentage-points (0.01 = one percent)
<i>external debt to assets</i>	external debt divided by total assets, measured in percentage-points (0.01 = one percent)
<i>net interest payments to assets</i>	total net interest payments divided by total assets, measured in percentage-points (0.01 = one percent)
<i>internal net interest payments to assets</i>	internal net interest payments divided by total assets, measured in percentage-points (0.01 = one percent)
<i>external net interest payments to assets</i>	external net interest payments divided by total assets, measured in percentage-points (0.01 = one percent)
<i>reform</i>	dummy variable, 1 if observation is made in the years 2008 - 2010, zero if observation is made in years 2005 - 2007
<i>treated</i>	dummy variable, 1 if company would have had non-deductible interest expenses according to the new interest barrier in all three years before the reform
<i>dependent</i>	dummy variable, 1 if company has no shareholder and no subsidiary with a participation rate of at least 25%
<i>Stricter</i>	dummy variable, 1 if company would have had more non-deductible interest expenses according to the new interest barrier compared to the old thin capitalization rule in all three years before the reform
<i>high lev</i>	dummy variable, 1 if company was in the group of firms with the 5% highest average leverage in the three years before the reform
<i>low prof</i>	dummy variable, 1 if company was in the group of firms with the 5% lowest average profitability in the three years before the reform
<i>tangibility</i>	tangible assets divided by total assets, measured in percentage-points (0.01 = one percent)
<i>profitability</i>	EBITDA divided by total assets, measured in percentage-points (0.01 = one percent)
<i>loss carryforward</i>	dummy variable, 1 if the profit before taxes was negative in the year before the observation
<i>str</i>	statutory tax rate, measured in percentage-points (0.01 = one percent)
<i>str * loss carryfwd</i>	interaction between <i>str</i> and <i>loss carryforward</i>
<i>ln employees</i>	logarithm of number of employees
<i>DEP/A</i>	amount of depreciation divided by total assets, measured in percentage-points (0.01 = one percent)

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i	interest rate computed by dividing interest paid by total debt, measured in percentage-points (0.01 = one percent)
r	profitability defined as EBIT divided by total assets, measured in percentage-points (0.01 = one percent)
λ	fraction of internal debt to total debt, measured in percentage-points (0.01 = one percent)

The general source of the variables is the DAFNE-database provided by Bureau van Dijk. Some variables are built by own computations using the information from DAFNE. Variables with names combining the above variables by * are interactions of the respective variables. The statutory tax rates are derived from the IBFD Global Corporate Tax Handbooks.

Table 5-2: Relative frequencies and numbers of firms in different groups

group	all firms	nationals	multinationals
<i>treated</i>	1.89 (487)	1.43 (334)	6.58 (153)
<i>stricter</i>	4.38 (345)	3.30 (214)	9.39 (131)
<i>high leveraged</i>	3.86 (1077)	3.98 (1018)	2.56 (59)
<i>high leveraged dependent</i>	3.56 (913)	3.68 (854)	n.a.
<i>high leveraged independent</i>	0.04 (11)	0.05 (11)	n.a.
<i>low profitable</i>	4.69 (1262)	4.53 (1115)	6.54 (147)
<i>low profitable dependent</i>	4.39 (1077)	4.18 (932)	n.a.
<i>low profitable independent</i>	0.06 (13)	0.06 (13)	n.a.

The table contains relative frequencies of firms in different groups in the regression samples in per cent. Absolute numbers are depicted in parentheses. *Treated* means that the company would have had non-deductible interest expenses triggering the new interest barrier in all three years before the reform. *Independent* means that the company has no 25% shareholder or subsidiary. *Stricter* means that the company would have had more non-deductible interest expenses based on the new interest barrier compared to the old rule in all three years before the reform. *High leveraged* means that the firm had one of the 5% highest average debt to assets ratios before the reform. *Low profitable* means that the firm had one of the 5% lowest average profitabilities before the reform.

5. Empirical Evaluation of Interest Barrier Effects

Table 5-3: Summaries

all companies					
Variable	Obs.	Mean	Std.Dev.	Min	Max
<i>debt to assets</i>	88,451	0.6204	0.2402	0.0002	1
<i>internal debt to assets</i>	65,802	0.1613	0.2017	0	0.9985
<i>external debt to assets</i>	65,802	0.4711	0.2399	0	0.9994
<i>net interest payments to assets</i>	88,333	0.0074	0.0267	-2.8348	1.2843
<i>internal net interest payments to assets</i>	29,225	0.0065	0.0139	-0.0119	1.2064
<i>external net interest payments to assets</i>	29,225	-0.0024	0.0265	-1.2019	0.3309
<i>reform</i>	88,451	0.5788	0.4938	0	1
<i>treated</i>	88,451	0.0204	0.1414	0	1
<i>treated * reform</i>	88,451	0.0117	0.1074	0	1
<i>dependent</i>	88,451	0.989	0.1041	0	1
<i>dependent * reform</i>	88,451	0.5724	0.4947	0	1
<i>stricter</i>	29,649	0.0451	0.2074	0	1
<i>stricter * reform</i>	29,649	0.025	0.1561	0	1
<i>high lev</i>	94,320	0.0323	0.1767	0	1
<i>high lev * reform</i>	94,320	0.0187	0.1354	0	1
<i>high lev * dependent</i>	87,519	0.0303	0.1713	0	1
<i>high lev * reform * dep</i>	87,519	0.0179	0.1326	0	1
<i>low prof</i>	92,938	0.0428	0.2024	0	1
<i>low prof * reform</i>	92,938	0.0234	0.1513	0	1
<i>low prof * dependent</i>	86,247	0.0406	0.1973	0	1
<i>low prof * reform * dep</i>	86,247	0.0227	0.149	0	1
<i>tangibility</i>	88,451	0.2581	0.2538	0	0.9984
<i>profitability</i>	88,451	0.1285	0.1374	-0.295	0.6358
<i>loss carryforward</i>	88,451	0.1617	0.3682	0	1
<i>str</i>	88,451	0.345	0.0417	0.3095	0.3943
<i>str * loss carryfwd</i>	88,451	0.0557	0.1278	0	0.3943
<i>str * tangibility</i>	88,451	0.0891	0.089	0	0.3931
<i>ln employees</i>	88,451	4.5997	1.295	0	12.2138
<i>DEP/A</i>	88,451	0.0472	0.3457	-0.0071	84.3892
<i>i</i>	84,333	0.0233	0.0374	0	7
<i>r</i>	88,451	0.0824	0.1732	-6.6173	4.5382
<i>λ</i>	65,802	0.2405	0.2595	0	1

5.6 Empirical Approach

In order to test my hypotheses I run regressions using a panel approach. I rely on the variation over time to analyze if and how firms altered their leverage after the introduction of the interest barrier. I apply a difference-in-difference approach in order to capture different reactions for different kinds of firms. My baseline regression equation is

$$\begin{aligned} \text{debt to assets}_{it} = & \beta_1 \cdot \text{treated}_i + \beta_2 \cdot \text{reform}_{it} + \beta_3 \cdot \text{treated}_i * \text{reform}_{it} \\ & + \mathbf{X}_{it} \beta + \delta_i + \delta_t + \delta_j + \delta_{jt} + \epsilon_{it} \end{aligned} \quad (7)$$

where *debt to assets_{it}* is total debt divided by total assets. The variable *treated_i* is a dummy that equals one if the considered firm would have been affected by the new interest barrier in all three years before its introduction.⁵⁰ *Reform_{it}* is a dummy indicating by the value of one if the observation is made after the introduction of the interest barrier. *Treated_i * reform_{it}* is the interaction of these two variables. **X** is the matrix of time-varying firm-specific control variables. Subscripts *i*, *j* and *t* denote the company, the industry and the year. Therefore, δ_i , δ_j and δ_t are company-, industry- and time-fixed effects, δ_{jt} is an industry-time-fixed effect capturing industry-specific developments of the leverage. *Treated_i* and *reform_{it}* are captured by the fixed effects; hence β_1 and β_2 are not reported. The coefficient of *treated_i * reform_{it}* shows if treated firms changed their debt to assets ratios in a different way than other firms. For the effects on firms which are more severe hit by the new interest barrier than by the old rule, I replace *treated_i* by *stricter_i*. This variable equals one if *treated_i* is one and non-deductible interest expenses according to the new rule were higher than those according to the old rule in all three years before the reform.⁵¹ This approach can be used to test H5-1. Considering H5-2, I split the sample into national companies and multinational companies. H5-3 is tested with the same equation replacing the dependent variable by internal and external debt to assets.

To test H5-4, I replace the treatment dummy by the variable *high lev_i* indicating if a company had an average debt to assets ratio before the reform that was higher than the 95 percent quantile of all considered firms. In addition, I introduce a three-way interaction to examine if highly leveraged firms which might be affected by the new interest barrier reacted differently

⁵⁰ For the labeling if a company is treated or not, I generally use the scheme of Figure 5-1. The escape clause, comparing the firm's leverage to the group's leverage is, however, disregarded. Concerning the group membership, I distinguish by the existence or non-existence of a 25% subsidiary and/or a 25% shareholder.

⁵¹ The non-deductible amount according to the old rule is calculated by comparing the firm's internal debt to the firm's equity. All interest expenses for such debt exceeding 1.5 times the equity are labeled as non-deductible.

from firms which do not have to worry about non-deductible expenses because they are independent and thus not affected by the new rule. Therefore the equation changes to

$$\begin{aligned} \text{debt to assets}_{it} = & \beta_1 \cdot \text{high lev}_i + \beta_2 \cdot \text{reform}_{it} + \beta_3 \cdot \text{dependent}_i \\ & + \beta_4 \cdot \text{high lev}_i * \text{reform}_{it} + \beta_5 \cdot \text{high lev}_i * \text{dependent}_i \\ & + \beta_6 \cdot \text{reform}_{it} * \text{dependent}_i + \beta_7 \cdot \text{high lev}_i * \text{reform}_{it} * \text{dependent}_i \\ & + \mathbf{X}_{it}\beta + \delta_i + \delta_t + \delta_j + \delta_{jt} + \epsilon_{it}. \end{aligned} \quad (8)$$

A positive β_4 means that independent highly leveraged firms have increased their leverage after the reform compared to other firms with lower debt to assets ratios. This coefficient is generally not expected to be significant because independent firms are never affected by the new interest barrier. For dependent firms, β_4 and β_7 must be added to see the whole effect. In addition, β_6 plus β_7 is the difference in reaction between highly leveraged dependent and independent firms. If these two coefficients are jointly significant, there is a specific interest barrier effect for potentially affected firms. I use this three-way interaction approach to capture the fact that highly leveraged firms might generally reduce their debt to assets ratios over time to return to their individually aspired ratio.⁵² The same kind of analysis is used to test H5-5 replacing the dummies for highly leveraged firms by a binary variable which is one if a company belongs to those firms with the 5 percent lowest average profitabilities before the reform.

5.7 Regression Results

My regressions deal one by one with the hypotheses derived in Section 4. The first three result tables, Tables 5-4 to 5-6, cover the issues outlined in hypotheses H5-1 to H5-3, while Table 5-7 and Table 5-8 trace H5-4 and H5-5. Table 5-4 is based on all firms, whereas Table 5-5 focuses on national firms and Table 5-6 focuses on multinationals. The same differentiation is maintained in Tables 5-7 and 5-8. The structure within the tables is always the same: The columns to the left of a table analyze the effects on *total* debt to assets, the columns in the middle focus on the

⁵² Cf. Weichenrieder and Windischbauer (2008).

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Table 5-4: Baseline regressions, all firms

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated * reform</i>	-0.0122** (0.0059)		-0.0016 (0.0072)		-0.0119 (0.0079)	
<i>stricter * reform</i>		-0.0144* (0.0077)		0.0114 (0.0081)		-0.0259*** (0.0092)
<i>tangibility</i>	0.0396** (0.0195)	0.0363 (0.0350)	-0.0189 (0.0237)	0.0188 (0.0409)	0.0397 (0.0252)	0.0086 (0.0393)
<i>profitability</i>	-0.1892*** (0.0071)	-0.1848*** (0.0116)	-0.0838*** (0.0088)	-0.1089*** (0.0134)	-0.1048*** (0.0085)	-0.0801*** (0.0119)
<i>loss carryforward</i>	0.1585*** (0.0093)	0.1246*** (0.0148)	0.0293** (0.0116)	0.0566*** (0.0176)	0.1064*** (0.0115)	0.0616*** (0.0162)
<i>str * loss carryfwd</i>	-0.3822*** (0.0270)	-0.2883*** (0.0430)	-0.0606* (0.0336)	-0.1306** (0.0508)	-0.2569*** (0.0334)	-0.1391*** (0.0466)
<i>str * tangibility</i>	-0.1485*** (0.0446)	-0.1049 (0.0825)	-0.1044* (0.0577)	-0.1677* (0.0993)	-0.0528 (0.0588)	0.0673 (0.0922)
<i>ln employees</i>	0.0192*** (0.0027)	0.0212*** (0.0038)	-0.0083*** (0.0030)	-0.0081* (0.0042)	0.0278*** (0.0029)	0.0285*** (0.0037)
observations	88451	29649	65802	27665	65802	27665
companies	25751	7878	20892	7661	20892	7661
R ²	0.1011	0.0971	0.0199	0.0347	0.0533	0.0533

The dependent variable is *debt to assets*. *Treated * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule in all three years before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction *stricter * reform* to analyze if firms, for which the new interest barrier would have been stricter than the old rule in all three years before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

effects on *internal* debt to assets and the columns to the right present the effects on *external* debt to assets. All regressions are difference-in-difference approaches showing the effects of the interest barrier introduction on financing decisions of different kinds of companies. I use a fixed effects estimator in order to capture unobserved firm, industry and time specific effects. The Annex shows additional results.

In columns (1) and (2) of Table 5-4, the ratio of total debt to assets serves as the dependent variable. The variable *treated* is a dummy that equals one for those firms which would have been affected by the new interest barrier in 2005, 2006 and in 2007 if it had been in place not only from 2008 onwards but already in the three previous years. This variable is captured by the firm-fixed effects. Being affected means that the interest barrier prevents the immediate deductibility of at least some interest expenses. The variable *reform* is a dummy that equals one for those observations that occur after the introduction of the interest barrier. This

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variable is captured by the year-fixed effects. The interaction of these two variables, *treated * reform*, shows if the difference between the leverage before and after the reform is lower or higher for affected firms compared to unaffected companies. The negative and significant coefficient of *treated * reform*, amounting to -0.0122, means that after the introduction of the interest barrier, those hypothetically affected firms lowered their debt to assets ratios more strongly or increased it less strongly than the control group. When interpreting the result, one has to keep in mind that I control for firm and industry-year-fixed effects. For example, if the control group lowered its debt to assets ratio after the reform by ten percentage points, the treatment group would have lowered it by 12.2 percentage points. Given that I focus on the size of the change, it can, however, not be seen from the coefficient if the decrease was bigger or the increase was smaller. In either way, the negative coefficient confirms my hypothesis H5-1, because firms concerned with the interest barrier chose, on average, a relatively lower debt to assets ratio after its introduction compared to other firms.

In the second sentence of hypothesis H5-1, I suppose that the lowered leverage should be observable especially concerning firms which are more severely affected by the new interest barrier than by the previous rule. The binary variable *stricter* equals one for firms for which in all three years 2005, 2006 and 2007, the hypothetically applied interest barrier would have led to more non-deductible interest than the previous rule which was in place at that time. The significant coefficient of the interaction effect *stricter * reform* -0.0144 indicates that firms which could expect to suffer more from the interest barrier than from the ratio-based thin capitalization rule supposedly lowered their debt to assets ratios more strongly than the control group. This confirms the second sentence in hypothesis H5-1.

As can be seen by looking at Table 5-4 as a whole, columns (3) and (4) show the results for the approaches outlined above using *internal* debt to assets as the dependent variable and columns (5) and (6) do so using *external* debt to assets as the dependent variable. Based on these general regressions, there is no significant impact of the interest barrier on the ratio of internal debt to assets. This can be seen from the fact that none of the crucial coefficients *treated * reform* and *stricter * reform* in columns (3) and (4) is significant.

Turning to the effect on *external* debt to assets, the results presented in columns (5) and (6) show a different picture. It seems that firms reacted to the introduction of the interest barrier predominantly with their external debt. The coefficient of *treated * reform* in column (5) shows the expected sign but fails to be significant. The crucial coefficient *stricter * reform* in column (6), however, clearly confirms hypothesis H5-3: After the introduction of the new

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interest barrier, companies reduced their external debt more strongly than their internal debt. By comparing the results in columns (5) and (6) to those in columns (3) and (4), I see that the affected companies did not significantly differ in adjusting their internal debt to assets ratios compared to non-affected firms. Their external debt to assets ratio adjustment, however, clearly differs from the one of the control group if the new interest barrier rule is more severe than the previous thin capitalization rule for the considered company. Those firms significantly reduced their external leverage after the reform compared to the control group. This result corresponds to the effects on all debt presented in column (2).

The control variables generally show the expected effects. The positive and sometimes also significant coefficient of *tangibility* can be explained by the fact that companies having lots of collateral can more easily and cheaply get loans and thus increase their leverage. *Profitability* shows a negative and significant coefficient, which means that profitable companies can reduce their leverage due to their ability of internally financing by means of retained earnings. The positive and significant coefficient of *loss carryforward* indicates that companies which made losses in the past need to raise debt to pay their dues and to keep their businesses running. The number of employees negatively impacts internal debt but positively affects the use of external debt. This is plausible, because, while some kind of debt is required by all kind of firms, a certain firm size may boost the ability to tap external sources. Overesch and Voeller (2010) use the interactions between *loss carryforward* and *str* and, in addition, *str* and *tangibility* in order to show that the positive tax effect on the debt to assets ratio decreases for firms with high non-debt tax shields. I find the same expected negative effects of both of these interactions on the total, internal and external leverage.⁵³ All of the control variables presented here are included in all of the regressions shown in the tables to follow. As they remain qualitatively unchanged, these control variables are not always explicitly reported.

Table 5-9 in the Appendix is very similar to Table 5-4 presented above. It differs, however, concerning the requirement of being treated before the interest barrier introduction. While in the above regressions the binary variable was one only if the firm was hypothetically affected in all three years 2005, 2006 and 2007, in the regressions shown in Table 5-9 it suffices if the company was hypothetically affected in *at least one* of the three years. The results of this sensitivity analysis in Table 5-9 are qualitatively generally the same as those from Table 5-4

⁵³ The result tables do not show coefficients for *str*, because the variation of this variable is the same for all considered companies and thus captured by the time-fixed effects.

discussed above. Tables 5-10 and 5-11 in the Appendix are analogue robustness checks for the results discussed below.

Table 5-4 shows results of regressions including all firms. In my second hypothesis H5-2, however, I suppose that multinationals and national firms showed different debt to assets reactions in face of the new interest barrier. In order to be able to evaluate this hypothesis, I split my sample into those firms which are purely national (cf. Table 5-5) and those belonging to a multinational group (cf. Table 5-6). Depending on the regression setup, only about 10% to 20% of the firms in my sample are multinationals, whereas 80% to 90% are national firms.

The results presented in Table 5-5 refer to national companies. They are qualitatively comparable to those of all firms presented and discussed above. In some cases, the significance or the size effects are higher than in the overall analysis, which indicates that it was mainly the national firms which reacted to the new interest barrier rule. For reasons of brevity, I do not discuss the results of Table 5-5 one by one, but only provide an overview. More detailed explanations of the coefficients can be achieved by referring to the discussion of Table 5-4. All in all, the results indicate that those national firms which are affected by the new interest barrier more strongly reduced their total debt to assets ratios than the control group. The specific reactions do not refer to the ratio of *internal* debt to assets, but they can be traced to the ratio of *external* debt to assets. This can be seen from the insignificant coefficient in column (4) as compared to the significant coefficients in column (6) of Table 5-5. Table 5-10 in the Appendix serves as a robustness check of Table 5-5 by reducing the requirement of being considered a treated national firm if it was hypothetically affected by the interest barrier at least once instead of three consecutive times between 2005 and 2007. The results presented in Table 5-10 are qualitatively very similar to those presented in Table 5-5.

Table 5-6 deals exclusively with multinational companies. As outlined above, there are not too many multinationals available in my sample. A look at the whole Table 5-6 shows that in only one case a crucial variable is (at the 10 percent level) significant, whereas all other coefficients are insignificant. The weakly significant coefficient of *stricter * reform* does not show the expected negative sign and does not prove to stay significant in robustness checks. I conclude from Table 5-6 that, contrary to the expectations expressed in hypothesis H5-2, multinationals did not show particularly strong reactions. My results rather indicate that multinationals did not significantly change their debt to assets ratios, whereas the national

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Table 5-5: Baseline regressions, nationals

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated * reform</i>	-0.0153** (0.0068)		-0.0051 (0.0083)		-0.0150 (0.0093)	
<i>stricter * reform</i>		-0.0240*** (0.0090)		0.0018 (0.0100)		-0.0280*** (0.0104)
<i>tangibility</i>	0.0407** (0.0200)	0.0468 (0.0367)	-0.0111 (0.0244)	0.0379 (0.0443)	0.0316 (0.0263)	-0.0039 (0.0427)
<i>profitability</i>	-0.1903*** (0.0074)	-0.1756*** (0.0123)	-0.0808*** (0.0095)	-0.1054*** (0.0147)	-0.1069*** (0.0092)	-0.0740*** (0.0131)
<i>loss carryforward</i>	0.1525*** (0.0097)	0.1281*** (0.0163)	0.0247* (0.0126)	0.0604*** (0.0203)	0.1059*** (0.0126)	0.0610*** (0.0183)
<i>str * loss carryfwd</i>	-0.3641*** (0.0281)	-0.2957*** (0.0473)	-0.0545 (0.0365)	-0.1513*** (0.0586)	-0.2479*** (0.0364)	-0.1252** (0.0527)
<i>str * tangibility</i>	-0.1788*** (0.0453)	-0.1706** (0.0865)	-0.1279** (0.0596)	-0.2244** (0.1077)	-0.0624 (0.0607)	0.0656 (0.0995)
<i>ln employees</i>	0.0163*** (0.0029)	0.0168*** (0.0044)	-0.0100*** (0.0032)	-0.0102** (0.0047)	0.0259*** (0.0032)	0.0267*** (0.0041)
observations	79278	23905	57340	22098	57340	22098
companies	23427	6483	18655	6276	18655	6276
R ²	0.1095	0.1092	0.0224	0.0427	0.0566	0.0577

The dependent variable is *debt to assets*. *Treated * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule in all three years before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction *stricter * reform* to analyze if firms, for which the new interest barrier would have been stricter than the old rule in all three years before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations not being a member of a multinational group between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

companies did show such interest barrier-induced adjustments. When interpreting Tables 5-5 and 5-6, one has to bear in mind, however, that the difference in significance levels might be attributable to the different sample sizes of national as compared to multinational companies. Table 5-11 in the Appendix serves as a robustness check for the regression results dealing with multinationals. Table 5-11 defines the *treated* and *stricter* variable like Tables 5-9 and 5-10. There, these variables already change to one if the company is affected in at least one of the three years before the reform. In Table 5-11 I find negative effects on all debt and external debt. These results differ from the ones presented in Table 5-6. However, the conclusion concerning H5-3 remains unchanged. Multinationals did not significantly reduce their *internal* leverage, although such a reduction was intended by the new interest barrier. In contrast to Tables 5-5 and 5-6, the consideration of Table 5-10 and Table 5-11 indicates that both national and multinational firms adjusted their leverage after the reform.

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Table 5-6: Baseline regressions, multinationals

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated * reform</i>	-0.0133 (0.0113)		0.0033 (0.0131)		-0.0107 (0.0142)	
<i>stricter * reform</i>		-0.0035 (0.0135)		0.0234* (0.0129)		-0.0235 (0.0170)
<i>tangibility</i>	0.1284 (0.0858)	0.0271 (0.1166)	-0.0198 (0.0945)	-0.0742 (0.1221)	0.1111 (0.0858)	0.1011 (0.1082)
<i>profitability</i>	-0.1755*** (0.0229)	-0.2214*** (0.0311)	-0.0967*** (0.0229)	-0.1233*** (0.0313)	-0.0920*** (0.0214)	-0.1042*** (0.0276)
<i>loss carryforward</i>	0.1666*** (0.0307)	0.0997*** (0.0360)	0.0361 (0.0293)	0.0221 (0.0345)	0.1004*** (0.0294)	0.0734** (0.0354)
<i>str * loss carryfwd</i>	-0.4119*** (0.0891)	-0.2310** (0.1039)	-0.0436 (0.0847)	-0.0011 (0.0999)	-0.2810*** (0.0856)	-0.2152** (0.1029)
<i>str * tangibility</i>	-0.0898 (0.2189)	0.1361 (0.2846)	-0.1272 (0.2383)	0.0117 (0.3026)	0.0596 (0.2213)	0.0937 (0.2669)
<i>ln employees</i>	0.0337*** (0.0062)	0.0357*** (0.0067)	-0.0031 (0.0074)	-0.0018 (0.0085)	0.0366*** (0.0072)	0.0348*** (0.0082)
observations	9173	5744	8462	5567	8462	5567
companies	2324	1395	2237	1385	2237	1385
R^2	0.1123	0.1380	0.0604	0.0803	0.0852	0.1024

The dependent variable is *debt to assets*. *Treated * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule in all three years before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction *stricter * reform* to analyze if firms, for which the new interest barrier would have been stricter than the old rule in all three years before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations being a member of a multinational group between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

Based on these robustness checks I cannot reject H5-2. The treatment group in Table 5-11 consists of firms which are not necessarily affected by the new interest barrier after the reform given that it suffices to be hypothetically affected only once to be a member of the treatment group. Therefore, on the one hand, based on what I find in Table 5-6, one cannot expect to find any significant effects for this group. On the other hand, such firms might be able to adjust their financing structure more appropriately than those serving as the treatment group in Table 5-6. This second aspect might explain why I find reactions for multinational companies only in Table 5-11.

In sum, the first three result tables yield three conclusions. First, confirming H5-1, after the introduction of the new interest barrier, the hypothetically ex ante hit firms, and especially those which are more severely affected by the new interest barrier, lowered their leverage. Second, concerning H5-2, my results in the robustness checks differ from the baseline results.

Thus, I can neither reject nor confirm this hypothesis. Third, confirming H5-3, the decreased attractiveness of external debt made companies lower their external rather than their internal debt. The third conclusion, based on the evidence presented above, indicates that the new interest barrier has possibly caused more damage than good. It intended to influence multinationals in such a way that they would reduce their internal debt to assets ratios. The analysis above, however, indicates that first and foremost *national* companies reacted by adjusting their *external* debt to assets ratio. In defending the interest barrier, one could put forward the argument that the multinationals are affected by the rule by no longer being able to deduct their interest expenses. Given that such firms are very likely to do tax planning, however, such an argument is rather unlikely to hold.

Table 5-12 in the Appendix presents an additional analysis which splits up the binary variable *treated* into some of its components. By differencing whether a company is part of a group or has at least one 25% shareholder, whether it has positive net interest payments, whether it exceeds the general interest allowance and whether its net interest payments exceed 30% of *EBITDA*, I can derive which aspects actually drive the firms to adjust their debt to assets ratios facing the new interest barrier. Table 5-12 in the Annex shows negative and significant coefficients of $net\ int > 0 * reform$ and $net\ int\ once > 0 * reform$, meaning that especially firms with more interest expenses than interest earnings reduced their debt to assets ratios after the reform. The negative and significant interaction in column (7) suggests that it also matters for firms' reactions whether the net interest payments exceed the 30% *EBITDA* threshold.

Table 5-13 in the Appendix serves as a general sensitivity analysis of the results presented in Table 5-4. In Table 5-13, the dependent variable is not the debt to assets ratio, but the *net interest payments to assets*. This accounts for the firms' possibility to align themselves with the new interest barrier by lowering their charged internal interest rates instead of reducing the debt to assets ratio. As can be seen, the conclusions to be drawn from Table 5-13 are the same as those from Table 5-4. Treated firms did not lower their internal net interest payments after the interest barrier introduction. I rather see a reduction of external net interest payments. The positive and significant coefficient of $treated * reform$ for internal debt indicates that treated firms exhibit an increased ratio compared to non-treated firms. This might be due to the fact that treated firms have a low profitability and need more debt to survive. See the discussion of Table 5-8 for details.

In tracing hypotheses H5-1 to H5-3, I only made the difference whether a company is hypothetically treated by the interest barrier or not or if it is treated more severely than by the old one. I did not distinguish to what degree such a company may be affected. It is probable that those firms which are denied only a minor amount of interest deductibility, might not consider changing, i.e. lowering, their leverage. As a robustness check, and in order to test hypotheses H5-4 and H5-5, I run additional regressions. In these regressions, I focus on highly leveraged companies and on companies with a low profitability. Analytical reasons for concentrating on these groups have been outlined in Section 3 above.

Table 5-7 aims at testing hypothesis H5-4, stating that after the introduction of the new interest barrier, especially the 5% previously most highly leveraged companies reduced their debt to assets ratios. The newly introduced variable *high lev* distinguishes, whether a firm is among the 5% most highly leveraged firms in terms of the mean debt to assets ratio in the three years before the reform. The dummy *dependent* is zero for firms which are independent, i.e. do not belong to a group and have no shareholder holding at least 25% of the shares. The new interest barrier does not apply to such independent firms. I suppose that the dependent highly leveraged and therefore concerned firms relatively reduced their debt to assets ratios compared to the never affected independent firms.

Table 5-7 is split into three horizontal sections with results for all companies in the first, national companies in the second and multinationals in the third section. All the control variables of the previous three tables are included in the regressions, but not reported in Table 5-7. They remained qualitatively very similar to the previous estimations in terms of size, sign and significance. Concentrating on all companies in the upper section of Table 5-7, I see that the most highly leveraged firms indeed reduced their overall leverage after the reform. This can be seen from the significant coefficient *high lev * reform* in column (1), amounting to -0.0078 and from the results presented in column (2). The coefficient of the three-way interaction *high lev * reform * dep* is negative and highly significant, indicating that the reaction to the reform differs not only between highly leveraged companies and firms with a lower debt to assets ratio, but that the difference between these two groups especially depends on the fact if the company is independent and therefore potentially affected by the interest barrier or not. *Dependent * reform* and *high lev * reform * dep* are jointly significant, which can be seen from the value of F_I in Table 5-7. This means that dependent highly leveraged firms relatively decreased their debt to assets ratios after the reform compared to highly leveraged but independent firms. These results confirm hypothesis H5-4.

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Table 5-7: Comparing highly leveraged companies with other companies

all debt			internal debt		external debt	
(1)	(2)		(3)	(4)	(5)	(6)
all companies						
<i>dependent * reform</i>		0.0109 (0.0073)		0.0147 (0.0096)		0.0093 (0.0101)
<i>high lev * reform</i>	-0.0078** (0.0035)	0.0340*** (0.0099)	-0.0316*** (0.0078)	0.0183 (0.0125)	0.0222*** (0.0075)	0.0280** (0.0137)
<i>high lev * reform * dep</i>		-0.0393*** (0.0105)		-0.0502*** (0.0150)		-0.0034 (0.0159)
observations	94320	87519	70339	65097	70339	65097
companies	27910	25466	22617	20614	22617	20614
R^2	0.0955	0.0998	0.0193	0.0206	0.0520	0.0539
F_1		8.23***		5.89***		0.54
F_2		7.09***		8.13***		6.57***
nationals						
<i>dependent * reform</i>		0.0090 (0.0073)		0.0133 (0.0095)		0.0093 (0.0102)
<i>high lev * reform</i>	-0.0052 (0.0036)	0.0337*** (0.0100)	-0.0307*** (0.0082)	0.0168 (0.0126)	0.0244*** (0.0079)	0.0304** (0.0142)
<i>high lev * reform * dep</i>		-0.0361*** (0.0105)		-0.0480*** (0.0154)		-0.0032 (0.0165)
observations	85156	78505	61876	56779	61876	56779
companies	25608	23204	20398	18435	20398	18435
R^2	0.1027	0.1083	0.0215	0.0231	0.0545	0.0573
F_1		7.10***		5.09***		0.52
F_2		5.96***		6.84***		7.09***
multinationals						
<i>high lev * reform</i>	-0.040*** (0.0139)	n.a. n.a.	-0.0363 (0.0243)	n.a. n.a.	-0.0033 (0.0233)	n.a. n.a.
observations	9164	n.a.	8463	n.a.	8463	n.a.
companies	2302	n.a.	2219	n.a.	2219	n.a.
R^2	0.1090	n.a.	0.0618	n.a.	0.0893	n.a.

The dependent variable is *debt to assets*. *High lev * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm is among the 5% highest leveraged firms defined by the mean of the three years before the reform. Regression 2 compares the effect for independent and dependent firms. A negative sign of the three-way interaction *high lev * reform * dep* means that the difference between debt to assets before and after the reform is lower for highly leveraged companies than for firms with lower debt, especially if they are dependent and therefore potentially affected by the interest barrier. The list of control variables is the same as in the other tables, the respective results are not reported. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations for German corporations between 2005 and 2010 stem from the DAFNE-database. In the first panel I show results for all firms, in the second and third panel I distinguish between national and multinational firms. For multinationals, there is no distinction between independent and dependent firms, as here all multinationals are dependent per definition. F_1 is the test-statistic for a test of joint significance of *dependent * reform* and *high lev * reform * dep*, F_2 is the test-statistic for a test of joint significance of *high lev * reform* and *high lev * reform * dep*. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

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The results presented in columns (3) and (4) of Table 5-7 show that the most highly leveraged firms indeed reduced their *internal* debt to assets ratio. Thus, by contrast to the general result drawn from Tables 5-4 to 5-6, the most highly leveraged firms seem to show the reaction intended by the interest barrier. The reaction can be identified, however, only for the national firms, as can be seen from the significant coefficients -0.0307 and -0.0480 at the center of Table 5-7. For multinationals, by contrast, the effect on the internal debt to assets ratio is insignificant. Only the coefficient dealing with the total debt to assets ratio is negative and significant. For such multinational companies, there is no distinction between independent and dependent firms, as here all multinationals are dependent by definition. With regard to external debt, columns (5) and (6) of Table 5-7 show only positive significant coefficients for the crucial variables. These findings suggest that the most highly leveraged firms increased their external debt after the reform compared to companies with lower debt to assets ratios. This result opposes to H5-3 and H5-4. Given that I, however, observe a reduction in internal leverage, the increase of external debt might in some sense just compensate this development. Testing the same hypotheses based on the 10% instead of the 5% most highly leveraged firms led to qualitatively very similar results.

The weak evidence in Table 5-7 suggests that at least some highly leveraged firms cut their internal debt to assets ratios, which is in line with the goals of the new interest barrier. However, these results cannot be identified for multinational firms. Based on my findings in Tables 5-4 to 5-6 I therefore rely on my previous conclusion that the interest barrier is harmful especially for firms and kinds of leverage that were not targeted by this new rule.

In Table 5-8, I aim at testing hypothesis H5-5, stating that after the introduction of the new interest barrier, especially the least profitable companies reduced their debt to assets ratio. The rationale behind this hypothesis has been outlined in Section 3 and 4. The overall structure of Table 5-8 is similar to the previous table. The newly introduced binary variable *low prof* equals one if the considered firm is among the group of firms with the 5% lowest profitability in terms of the mean profitability in the three years before the reform. Column (1) shows the overall effect. The positive and significant coefficients run in opposition against hypothesis H5-5. The least profitable firms have increased their debt to assets ratios. This can be observed both for national firms and for multinationals. If the firms were supposed to make their leverage decisions solely based on the interest barrier, their behavior is counter-intuitive. From a general point of view, however, the increase in the debt to assets ratio for the least profitable firms is well understandable. Firms with extremely low profitability seem to have

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Table 5-8: Comparing firms with lowest profitability with other companies

		all debt		internal debt		external debt	
		(1)	(2)	(3)	(4)	(5)	(6)
all companies							
<i>dependent * reform</i>			0.0126* (0.0069)		0.0192*** (0.0073)		0.0077 (0.0100)
<i>low prof * reform</i>	0.0175*** (0.0057)		0.1487** (0.0630)	-0.0061 (0.0066)	0.4059*** (0.0104)	0.0229*** (0.0066)	-0.0061 (0.0119)
<i>low prof * reform * dep</i>			-0.129** (0.0633)		-0.4134*** (0.0121)		0.0314** (0.0134)
observations	92938		86247	69481	64306	69481	64306
Companies	26880		24521	21962	20010	21962	20010
R^2	0.0961		0.1007	0.0183	0.0203	0.0522	0.0542
F_1			3.41***		8832.72***		10.03***
F_2			7.49***		767.71***		6.71***
nationals							
<i>dependent * reform</i>			0.0110 (0.0069)		0.0179** (0.0073)		0.0079 (0.0101)
<i>low prof * reform</i>	0.0144** (0.0060)		0.1508** (0.0636)	-0.0081 (0.0072)	0.4047*** (0.0111)	0.0232*** (0.0073)	0.0028 (0.0125)
<i>low prof * reform * dep</i>			-0.1343** (0.0638)		-0.4141*** (0.0130)		0.0237* (0.0142)
observations	83847		77306	61079	56049	61079	56049
companies	24631		22312	19787	17875	19787	17875
R^2	0.1033		0.1092	0.0206	0.0229	0.0546	0.0575
F_1			3.15***		684.37***		5.34***
F_2			5.97***		675.58***		5.77***
multinationals							
<i>low prof * reform</i>	0.0322* (0.0168)	n.a. n.a.	0.0089 (0.0155)	n.a. n.a.	0.0147 (0.0166)	n.a. n.a.	
observations	9091	n.a.	8402	n.a.	8402	n.a.	
companies	2249	n.a.	2175	n.a.	2175	n.a.	
R^2	0.1097	n.a.	0.0611	n.a.	0.0899	n.a.	

The dependent variable is *debt to assets*. *Low prof * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm is among the group of firms with the 5% lowest profitability defined by the mean of the three years before the reform. Regression 2 compares the effect for independent and dependent firms. A negative sign of the three-way interaction *low prof * reform * dep* means that the difference between debt to assets before and after the reform is lower for companies with the lowest profitability than for firms with a higher profitability, especially if they are dependent and therefore potentially affected by the interest barrier. The list of control variables is the same as in the other tables, the respective results are not reported. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations for German corporations between 2005 and 2010 stem from the DAFNE-database. In the first panel I show results for all firms, in the second and third panel I distinguish between national and multinational firms. For multinationals, there is no distinction between independent and dependent firms, as here all multinationals are dependent per definition. F_1 is the test-statistic for a test of joint significance of *dependent * reform* and *low prof * reform * dep*, F_2 is the test-statistic for a test of joint significance of *low prof * reform* and *low prof * reform * dep*. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

other concerns than their interest deductibility. They are in need of financing to keep their business running. Due to a lack of internal funds and a decent attractiveness to equity investors, they necessarily increase their debt. This result is in line with the negative coefficient of the control variable *profitability*, meaning that more profitable companies have lower debt to assets ratios than low profitable firms.

The results from column (2) of Table 5-8 reveal an interesting additional aspect. The general positive effect of *low prof * reform* persists, but the three-way interaction *low prof * reform * dep* shows negative and significant coefficients of -0.1299 and -0.1343 respectively. As it is also jointly significant with *dependent * reform*, I can conclude that, among the group of low profitable firms, the dependent firms relatively decreased their debt to assets ratios compared to the independent firms. Therefore, even though the interest barrier does not play the most important role for the low profitable firms overall, it still seems to be considered in the way supposed in hypothesis H5-5. This cannot be shown for multinational firms, however, because all multinationals are dependent firms. As can be seen from column (4) of Table 5-8, the positive general effect and the negative interest barrier effect prevail when focusing on the internal debt to assets ratio. The results in columns (5) and (6), indicating an increased external debt to assets ratio for national firms with the lowest profitability, oppose the general hypothesis H5-3 for these kinds of firms. Concerning external debt, hypothesis H5-5 is not confirmed by low profitability firms either. Testing hypothesis H5-5 based on the 10% instead of the 5% least profitable firms led to qualitatively very similar results.

5.8 Conclusion

I have analyzed the impact of the new interest barrier on firms' financing structures. I distinguish between national firms and multinationals and between the effects on internal debt to assets and external debt to assets. The interest barrier has been introduced as of 2008 with the primary purpose of preventing multinationals from abusive tax avoidance by means of cross-border internal loans.

In my general regressions, I find that the interest barrier made firms lower their debt to assets ratios and their net interest payments. Opposing its original intention, it seems to be, however, the national rather than the multinational firms which adjusted their capital structure and it is external rather than internal debt which is reduced. Therefore, at large I conclude that the

interest barrier does indeed affect financing decisions, but predominantly not in the intended way and not of the intended firms.

In a robustness check, I find that highly leveraged firms reduce their internal debt to assets ratios. This reaction can, however, only be reliably identified for national firms. It is unclear if, at least, the most likely targeted multinationals were influenced by the new interest barrier in the way intended.

A further robustness check reveals that, as expected, firms which are likely to be subject to the interest barrier because they have a very low profitability tackle the threat of non-deductible interest by relatively reducing their debt to assets ratios. This interest barrier effect, however, is overcompensated by such firms' basic need for debt financing to keep their business running. Therefore, in total, low profitable firms relatively increased their leverage after the reform.

All in all, my empirical evidence does not give a positive reference to the new interest barrier rule. The legislator might have focused too much on the, albeit, justified and comprehensible task to counteract excessive and abusive internal lending by a few multinationals. Based on the evidence found in this study, the end may hardly justify the means. Significantly influencing i.e. distorting the financing decisions of companies which were not even aimed at is considerable collateral damage. At the same time, from an empirical point of view, it remains unclear if the unbeloved multinational financing structures could be prevented effectively.

5.9 Appendix

Table 5-9: Baseline regressions, all firms, at least once treated

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>once treated * reform</i>	-0.0074* (0.0040)		0.0008 (0.0049)		-0.0111** (0.0051)	
<i>once stricter * reform</i>		-0.0077 (0.0058)		0.0100 (0.0064)		-0.0195*** (0.0065)
<i>tangibility</i>	0.0323* (0.0189)	0.0370 (0.0350)	-0.0185 (0.0228)	0.0190 (0.0409)	0.0378 (0.0243)	0.0086 (0.0392)
<i>profitability</i>	-0.1873*** (0.0069)	-0.1848*** (0.0116)	-0.0748*** (0.0085)	-0.1091*** (0.0134)	-0.1099*** (0.0081)	-0.0799*** (0.0119)
<i>loss carryforward</i>	0.1595*** (0.0090)	0.1238*** (0.0150)	0.0281** (0.0112)	0.0558*** (0.0177)	0.1077*** (0.0111)	0.0623*** (0.0162)
<i>str * loss carryfwd</i>	-0.3836*** (0.0261)	-0.2859*** (0.0434)	-0.0546* (0.0322)	-0.1284** (0.0510)	-0.2628*** (0.0322)	-0.1409*** (0.0467)
<i>str * tangibility</i>	-0.1471*** (0.0430)	-0.1061 (0.0825)	-0.1107** (0.0559)	-0.1691* (0.0992)	-0.0564 (0.0567)	0.0688 (0.0921)
<i>ln employees</i>	0.0192*** (0.0026)	0.0211*** (0.0038)	-0.0085*** (0.0028)	-0.0081* (0.0042)	0.0274*** (0.0028)	0.0285*** (0.0037)
observations	95211	29649	70987	27665	70987	27665
companies	28213	7878	22897	7661	22897	7661
R2	0.0969	0.0969	0.0184	0.0348	0.0517	0.0533

The dependent variable is debt to assets. Once treated * reform is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule at least in one year before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction once stricter * reform to analyze if firms, for which the new interest barrier would have been stricter than the old rule at least in one year before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

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Table 5-10: Baseline regressions, nationals, at least once treated

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>once treated * reform</i>	-0.0071 (0.0046)		-0.0021 (0.0059)		-0.0079 (0.0062)	
<i>once stricter * reform</i>		-0.0140** (0.0070)		0.0029 (0.0079)		-0.0184** (0.0078)
<i>tangibility</i>	0.0330* (0.0193)	0.0475 (0.0367)	-0.0111 (0.0235)	0.0379 (0.0443)	0.0299 (0.0254)	-0.0032 (0.0427)
<i>profitability</i>	-0.1877*** (0.0072)	-0.1755*** (0.0123)	-0.0708*** (0.0091)	-0.1055*** (0.0147)	-0.1120*** (0.0087)	-0.0737*** (0.0131)
<i>loss carryforward</i>	0.1534*** (0.0094)	0.1272*** (0.0164)	0.0246** (0.0121)	0.0599*** (0.0204)	0.1048*** (0.0121)	0.0607*** (0.0183)
<i>str * loss carryfwd</i>	-0.3659*** (0.0271)	-0.2932*** (0.0476)	-0.0512 (0.0348)	-0.1498** (0.0588)	-0.2477*** (0.0348)	-0.1244** (0.0527)
<i>str * tangibility</i>	-0.1763*** (0.0437)	-0.1711** (0.0866)	-0.1351** (0.0578)	-0.2246** (0.1077)	-0.0647 (0.0586)	0.0657 (0.0994)
<i>ln employees</i>	0.0167*** (0.0027)	0.0167*** (0.0044)	-0.0098*** (0.0030)	-0.0102** (0.0047)	0.0254*** (0.0030)	0.0266*** (0.0041)
observations	85889	23905	62381	22098	62381	22098
companies	25851	6483	20622	6276	20622	6276
R^2	0.1042	0.1089	0.0206	0.0427	0.0540	0.0575

The dependent variable is debt to assets. Once treated * reform is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule at least in one year before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction once stricter * reform to analyze if firms, for which the new interest barrier would have been stricter than the old rule at least in one year before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations not being a member of a multinational group between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

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Table 5-11: Baseline regressions, multinationals, at least once treated

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>once treated * reform</i>	-0.0213** (0.0084)		0.0027 (0.0092)		-0.0249*** (0.0093)	
<i>once stricter * reform</i>		-0.0062 (0.0102)		0.0161 (0.0107)		-0.0242** (0.0113)
<i>tangibility</i>	0.1182 (0.0852)	0.0251 (0.1169)	-0.0199 (0.0945)	-0.0757 (0.1219)	0.1022 (0.0846)	0.0982 (0.1079)
<i>profitability</i>	-0.1799*** (0.0229)	-0.2210*** (0.0311)	-0.0965*** (0.0230)	-0.1236*** (0.0313)	-0.0966*** (0.0213)	-0.1033*** (0.0275)
<i>loss carryforward</i>	0.1789*** (0.0310)	0.1016*** (0.0363)	0.0362 (0.0294)	0.0220 (0.0347)	0.1174*** (0.0293)	0.0775** (0.0355)
<i>str * loss carryfwd</i>	-0.4443*** (0.0901)	-0.2366** (0.1048)	-0.0407 (0.0853)	-0.0015 (0.1006)	-0.3312*** (0.0857)	-0.2266** (0.1035)
<i>str * tangibility</i>	-0.0608 (0.2173)	0.1422 (0.2853)	-0.1221 (0.2387)	0.0160 (0.3024)	0.0791 (0.2170)	0.1029 (0.2659)
<i>ln employees</i>	0.0324*** (0.0062)	0.0356*** (0.0067)	-0.0045 (0.0075)	-0.0018 (0.0086)	0.0368*** (0.0072)	0.0346*** (0.0083)
observations	9322	5744	8606	5567	8606	5567
companies	2362	1395	2275	1385	2275	1385
R^2	0.1110	0.1382	0.0597	0.0800	0.0901	0.1035

The dependent variable is debt to assets. Once treated * reform is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule at least in one year before the introduction. A negative sign of the coefficient means that the difference between the leverage before and after the reform is lower for treated firms compared to companies not treated by the new interest barrier. In regression 2 I use the interaction once stricter * reform to analyze if firms, for which the new interest barrier would have been stricter than the old rule at least in one year before the reform, reduced their debt to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations of German corporations being a member of a multinational group between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

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Table 5-12: Regressions for single interest barrier steps, all firms, all debt

	treatment all years before reform				treatment at least one year before the reform		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dependent * reform	0.0097 (0.0070)						
net int > 0 * reform		-0.0176*** (0.0017)					
high net int * reform			0.0002 (0.0032)				
high EBITDA * reform				-0.0028 (0.0027)			
net int once > 0 * reform					-0.0215*** (0.0019)		
once high net int * reform						0.0021 (0.0027)	
once high EBITDA * reform							-0.0046** (0.0020)
tangibility	0.0367* (0.0194)	0.0837*** (0.0195)	0.0315* (0.0189)	0.0320* (0.0189)	0.0828*** (0.0194)	0.0306 (0.0189)	0.0321* (0.0188)
profitability	-0.1886*** (0.0071)	-0.1867*** (0.0069)	-0.1875*** (0.0069)	-0.1872*** (0.0069)	-0.1871*** (0.0069)	-0.1875*** (0.0069)	-0.1865*** (0.0069)
loss carryforward	0.1559*** (0.0092)	0.1648*** (0.0089)	0.1570*** (0.0089)	0.1593*** (0.0091)	0.1665*** (0.0089)	0.1565*** (0.0089)	0.1648*** (0.0092)
str * loss carryfwd	-0.3745*** (0.0268)	-0.3990*** (0.0258)	-0.3764*** (0.0259)	-0.3830*** (0.0263)	-0.4044*** (0.0257)	-0.3749*** (0.0259)	-0.3995*** (0.0268)
str * tangibility	-0.1439*** (0.0445)	-0.3028*** (0.0454)	-0.1446*** (0.0432)	-0.1462*** (0.0430)	-0.2990*** (0.0451)	-0.1415*** (0.0432)	-0.1462*** (0.0430)
ln employees	0.0194*** (0.0027)	0.0192*** (0.0025)	0.0192*** (0.0025)	0.0191*** (0.0025)	0.0193*** (0.0025)	0.0192*** (0.0025)	0.0191*** (0.0025)
observations	90854	95334	95334	95329	95334	95334	95334
companies	27487	28236	28236	28234	28236	28236	28236
R ²	0.1004	0.0995	0.0968	0.0968	0.1002	0.0968	0.0969

The dependent variable is *debt to assets*. *Dependent * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm is a member of a group or has at least one 25% shareholder. A negative sign of the coefficient means that the difference between leverage before and after the reform is lower for dependent firms compared to companies not captured by the new interest barrier. Regression 2 compares companies with positive net interest payments to other firms. In regression 3 I use the interaction *high net int * reform* to analyze if firms with net interest payments exceeding EUR 1 million reduced their debt to assets ratios more strongly or increased it to a lower extend than other firms. Regression 4 compares companies with net interest payments exceeding 30% of EBITDA. While regressions 2 to 4 define the treatment dummies by requiring the condition in all three years before the reform, regressions 5 to 7 use a treatment dummy defined by fulfilling the condition at least in one year before the reform, respectively. Other variables are described in Table 5-1. Regressions include company and industry-year-fixed effects. Observations for German corporations between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%, ** at 5% and *** at 1% level.

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Table 5-13: Baseline regressions on net interest payments per assets as, all firms

	all debt		internal debt		external debt	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>treated * reform</i>	-0.0068*** (0.0011)		0.0014** (0.0007)		-0.0084*** (0.0016)	
<i>stricter * reform</i>		-0.0049*** (0.0011)		0.0012 (0.0008)		-0.0072*** (0.0017)
<i>tangibility</i>	0.0148*** (0.0020)	0.0150*** (0.0034)	0.0062 (0.0059)	0.0103 (0.0085)	0.0069 (0.0077)	0.0037 (0.0101)
<i>profitability</i>	-0.0007 (0.0011)	-0.0045*** (0.0014)	-0.0012 (0.0017)	-0.0019 (0.0024)	-0.0003 (0.0028)	-0.0004 (0.0035)
<i>loss carryforward</i>	0.0031** (0.0013)	0.0004 (0.0018)	0.0019 (0.0017)	0.0012 (0.0022)	-0.0026 (0.0029)	-0.0014 (0.0037)
<i>str * loss carryfwd</i>	-0.0026 (0.0037)	0.0060 (0.0051)	-0.0042 (0.0049)	-0.0027 (0.0063)	0.0117 (0.0083)	0.0098 (0.0103)
<i>str * tangibility</i>	0.0148*** (0.0051)	0.0102 (0.0079)	-0.0275* (0.0141)	-0.0316 (0.0199)	0.0526*** (0.0181)	0.0534** (0.0240)
<i>ln employees</i>	0.0006** (0.0002)	0.0003 (0.0004)	-0.0007** (0.0003)	-0.0008* (0.0004)	0.0009* (0.0005)	0.0009 (0.0006)
observations	88333	29631	29225	17829	29225	17829
companies	25746	7877	10077	5653	10077	5653
R^2	0.0594	0.0497	0.0385	0.0315	0.0777	0.0525

The dependent variable is *net interest payments to assets*. *Treated * reform* is an interaction of dummies which equals 1 if the observation is made after the introduction of the interest barrier and the firm would have been treated by the new rule in all three years before the introduction. A negative sign of the coefficient means that the difference between the net interest payments before and after the reform is lower for treated firms compared to companies not affected by the new interest barrier. In regression 2 I use the interaction *stricter * reform* to analyze if firms, for which the new interest barrier would have been stricter than the old rule in all three years before the reform, reduced their net interest payments to assets ratios more strongly or increased it to a lower extent than other firms. Other variables are described in Table 5-1. Regressions 3 and 4 repeat regressions 1 and 2 using internal debt to assets as the dependent variable, regressions 5 and 6 use external debt to assets. Regressions include company and industry-year-fixed effects. Observations for German corporations between 2005 and 2010 stem from the DAFNE-database. Robust standard errors, clustered at the subsidiary level, are shown in parentheses. * denotes significance at the 10%-level, ** at the 5%-level and *** at the 1%-level.

5.10 References

- Alworth, J. and G. Arachi (2001): The effect of taxes on corporate financing decisions: Evidence from a panel of Italian firms, *International Tax and Public Finance* 8, 353 - 376.
- Bach, S. and H. Buslei (2009): Zinsschranke trifft vor allem Grossunternehmen, *DIW-Wochenbericht* 76, 283 - 287.
- Blaufus, K. and D. Lorenz (2009): Die Zinsschranke in der Krise, *Steuer und Wirtschaft* 86, 323 - 332.
- Blaufus, K. and D. Lorenz (2009): Wem droht die Zinsschranke? Eine empirische Untersuchung zur Identifikation der Einflussfaktoren, *Zeitschrift für Betriebswirtschaft* 79, 503 - 526.
- Bolik, A., C. Fuest and M. Ortmann-Babel (2010): *Studie zur Evaluation der Gegenfinanzierung der Unternehmensteuerreform 2008*, Ernst & Young GmbH.
- BR-Drucksache 220/07 (2007): Gesetzentwurf der Bundesregierung, *Entwurf eines Unternehmensteuerreformgesetzes 2008*.
- Buettner, T., M. Overesch, U. Schreiber und G. Wamser (2008): *The Impact of Thin Capitalization Rules on Multinationals' Financing and Investment Decisions*, Bundesbank Discussion Paper 03/2008, Frankfurt.
- Desai, M.A., C.F. Foley and J.R. Hines (2004): A multinational perspective on capital structure choice and internal capital markets, *Journal of Finance* 59, 2451 - 2487.
- Dörfler, H. and A. Vogl (2007): Unternehmensteuerreform 2008: Auswirkungen der geplanten Zinsschranke anhand ausgewählter Beispiele, *Betriebs Berater* 62, 1084 - 1087.
- Dourado, A.P. and R. de la Feria (2008): *Thin capitalization rules in the context of the CCCTB*, Oxford University Centre for Business Taxation Working Paper 08/04.
- Eilers, S. (2007): Fremdfinanzierung im Unternehmen nach der Unternehmenseuerreform 2008, *Finanzrundschau* 89, 733 - 735.
- Endres, D. (2007): Auswirkungen der Zinsschranke auf die Gesellschafter-Fremdfinanzierung, *Praxis Internationale Steuerberatung*, 230 - 235.
- Feld, L., J. Heckemeyer and M. Overesch (2011): *Capital Structure Choice and Company Taxation: A Meta-Study*, CESifo Working Paper No. 3400, Munich.
- Führich, G. (2007): Ist die geplante Zinsschranke europarechtskonform? *Internationales Steuerrecht*, 341 - 345.
- Ganssaue, K. and O. Mattern (2008): Der Eigenkapitaltest im Rahmen der Zinsschranke, *Deutsches Steuerrecht*, 213 - 219 and 267 - 270.
- Gordon, R. and Y. Lee (2001): Do taxes affect corporate debt policy? Evidence from U.S. corporate tax return data, *Journal of Public Economics* 82, 195 - 224.
- Gordon, R. and Y. Lee (2007): Interest rates, taxes and corporate financial policies, *National Tax Journal* 60, 65 - 84.
- Graham, J.R. (1999): Do personal taxes affect corporate financing decisions?, *Journal of Public Economics* 73, 147 - 185.

- Graham, J.R. (2003): Taxes and corporate finance: A review, *Review of Financial Studies* 16, 1075 - 1129.
- Grotherr, S. (2008): Funktionsweise und Zweifelsfragen der neuen Zinsschranke, *Internationale Wirtschafts-Briefe* 07, 1489 - 1508.
- Haufler, A. and M. Runkel (2008): *Firms' financial choices and thin capitalization rules under corporate tax competition*, CESifo Working Paper No. 2429, Munich.
- Herzig, N. and A. Bohn (2007): Modifizierte Zinsschranke und Unternehmensfinanzierung, *Der Betrieb* 60, 1 - 10.
- Herzig, N., U. Lochmann and B. Liekenbrock (2008): Die Zinsschranke im Lichte einer Unternehmensbefragung. Einfluss auf Steuerplanung, Steuergestaltung und Steuerbelastung, *Der Betrieb* 61, 593 - 602.
- Herzig, N. and B. Liekenbrock (2010): Zum EBITDA-Vortrag der Zinsschranke, *Der Betrieb*, 690 - 695.
- Hey, J. (2007): Verletzung fundamentaler Besteuerungsprinzipien durch die Gegenfinanzierungsmassnahmen des Unternehmenssteuerreformgesetzes 2008, *Betriebs-Berater* 62, 1303 - 1309.
- Homburg, S. (2007): Die Zinsschranke - eine beispiellose Steuerinnovation, *Finanzrundschau* 89, 717 - 728.
- Homburg, S., H. Houben and R. Maiterth (2007): Rechtsform und Finanzierung nach der Unternehmensteuerreform 2008, *Die Wirtschaftsprüfung* 60, 376 - 381.
- Hornig, M. (2007): Die Zinsschranke - ein europarechtlicher Irrweg, *Praxis Internationale Steuerberatung*, 215 - 220.
- Huizinga, H., L. Laeven and G. Nicodème (2008): Capital structure and international debt shifting, *Journal of Financial Economics* 88, 80 - 118.
- Köhler, S. (2007): Erste Gedanken zur Zinsschranke nach der Unternehmensteuerreform, in: *Deutsches Steuerrecht* 45, 597 - 604.
- Lemmon, M.L., M.R. Roberts and J.F. Zender (2008): Back to the beginning: persistence and the cross-section of corporate capital structure, *Journal of Finance* 63, 1575 - 1608.
- Lenz, M., O. Doerfler and G. Adrian (2010): Änderungen bei der Zinsschranke durch das Wachstumsbeschleunigungsgesetz, *Die Unternehmensbesteuerung*, 1 - 7.
- MacKie-Mason, J.K. (1990): Do taxes affect corporate financing decisions?, *Journal of Finance* 45, 1471 - 1493.
- Miller, M. (1977): Debt and taxes, *Journal of Finance* 32, 261-275.
- Modigliani, F. and M. Miller (1958): The cost of capital, corporation finance, and the theory of investment, *American Economic Review* 48, 261 - 297.
- Modigliani, F. and M. Miller (1963): Corporate income taxes and the cost of capital: a correction, *American Economic Review* 53, 433 - 443.
- Musil, A. and B. Volmering (2008): Systematische, verfassungsrechtliche und europarechtliche Probleme der Zinsschranke, *Der Betrieb* 1, 12 - 16.
- Myers, S. C. (1977): Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147 - 175.
- Myers, S. C. (1984): The capital structure puzzle, *Journal of Finance* 39, 575 - 592.

- Overesch, M. and D. Voeller (2010): The Impact of Personal and Corporate Taxation on Capital Structure Choices, *Public Finance Analysis* 66, 263 - 294.
- Pasedag, A. (2010): Paradoxe Wirkungen der Zinsschranke, *Corporate Finance biz* 12/5, 301 - 311.
- Piltz, D.J. (1996): *International aspects of thin capitalization*, IFA general report vol. LXXXIb, Rotterdam 1996, 19 - 81.
- Rajan, R.G. and L. Zingales (1995): What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421 - 1460.
- Rödter, T. and I. Stangl (2007): Zur geplanten Zinsschranke, *Der Betrieb*, 479 - 485.
- Rödding, A. (2009): Änderungen der Zinsschranke durch das Wachstumsbeschleunigungsgesetz, *Deutsches Steuerrecht*, 2649 - 2651.
- Schwarz, P. (2008): Zur Notwendigkeit einer Zinsschranke: Empirische Befunde und Probleme, *Internationales Steuerrecht* 1, 11 - 14.
- Taub, A.J. (1975): Determinants of firm's capital structure, *Review of Economics and Statistics* 57, 410 - 416.
- Thiel, J. (2007): Die Steuerliche Behandlung von Fremdfinanzierungen im Unternehmen, *Finanzrundschau* 89, 729 - 733.
- Thoemmes, O., R. Stricof and K. Nakhai (2004): Thin Capitalization Rules and Non-Discrimination Principles, *International Tax Review*, 126 - 137.
- Töben, T. (2007): Die Zinsschranke - Befund und Kritik, *Finanzrundschau* 89, 739 - 746.
- Wamser, G. (2008): *The Impact of Thin capitalization Rules on External Debt Usage - A Propensity Score Matching Approach*, ifo Working Paper No. 62.
- Weichenrieder, A. and H. Windischbauer (2008): *Thin Capitalization Rules and Company Responses*, CESifo Working Paper No. 2456, Munich.
- Winkeljohann, N. and S. Fuhrmann (2007): *Grundprinzipien der Zinsschranke*, in: Die Unternehmenssteuerreform 2008, PwC, Stuttgart, 76 - 120.
- Welling, B. (2007): Die Zinsschranke. Übersteigerte politische Zielvorgabe an eine Neuordnung der Regelungen zur Gesellschafter Fremdfinanzierung, *Finanzrundschau* 89, 735 - 739.

5.11 Survey 3: Empirical evidence on the tax impact on financing decisions

Survey ⁵⁴	Data	Methodology	Results
Aggarwal, Kyaw (2008)	Data from US multinational company affiliates in 62 countries taken from the 1989, 1994, and 1999 Bureau of Economic Analysis benchmark surveys.	The paper traces the impact of tax characteristics and other drivers on the overall leverage of an affiliate and on the kind of debt used. Thus, the dependent variables are capital structure variables such as the total debt ratio, the external debt ratio, the net parent debt ratio, and the different interest rates. Important independent variables: excess tax, host tax, private credit, political risk, and corruption index. The paper also provides correlation coefficients between these variables.	Multinationals' affiliates, located in countries with low credit availability, poor creditor protection, high political risk, and high inflation are found to bear high interest costs and multinational affiliate debt ratios are high in high tax countries. All in all, the findings suggest that affiliates substitute external debt with parent debt using internal capital markets to overcome weak external financial markets and institutional environments.
Altshuler, Grubert (2003)	Cross-sectional firm-level observations of foreign subsidiaries belonging to groups headquartered in the US. Tax return data provided by the Internal Revenue Service.	The international variation of local corporate income tax rates is used for identification.	A 10 percentage point increase in the local tax rate makes the debt ratio increase by 3.93 percentage points. The same tax rate increase by 10 percentage points causes the share of internal debt owed to the mother company to increase by 0.65 percentage points.
Alworth, Arachi (2001)	The Italian Centrale dei Bilanci database provides a panel of 1,054 Italian companies covering the years 1982 till 1994. The sample consists of operative manufacturing companies with sales exceeding Italian lira 10 billion.	Graham-Shevlin methodology for the calculation of company-specific marginal tax rates, considering the asymmetric taxation of profits and losses. Incremental financing decisions are analyzed in order to test whether taxes encourage the use of debt. The paper also traces to what extent personal taxes affect corporate financing decisions. The marginal tax rates' endogeneity is regarded one by one by using a lagged value of the simulated marginal tax rate and by the application of a before-financing marginal tax rate.	The cross-sectional analysis provides strong evidence for the impact of both corporate and personal taxes on companies' financing decisions. The time-series analysis weakly confirms these results. At the mean, a 100 basis point increase in the marginal corporate tax rate increases the ratio of growth of debt to total assets by about eight basis points. The also significant impact of personal taxes amounts to three basis points.

⁵⁴ Some of the methodologies' and results' summaries quote the respective papers literally.

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An (2012)	Chinese Industrial Enterprises Database from 2002 to 2008 providing firm-level information of companies with annual sales revenue above RMB 5 million. As of 2008, the database included 412,212 industrial enterprises, which accounts for about 95% of the total industrial output value of China.	Difference-in-differences approach in order to determine whether foreign investment enterprises responded to the major Chinese tax law change in 2008 by raising debt ratios. The tax law change terminated the dual corporate income tax regime by removing the preferential tax treatments offered to foreign investment enterprises and unified the profit tax rate for all companies.	Consistent with theoretical expectations, foreign investment enterprises have responded to the detrimental tax law change by raising their debt ratios. Especially the Hong Kong–Macau–Taiwan investment enterprises showed to be very sensitive to the removal of the preferential tax treatments. Furthermore, the reactions were stronger when including privately-owned enterprises into the control group as compared to only focusing on state-owned enterprises, given that the latter might benefit from governmental support.
Antoniou, Guney, Paudya (2008)	Pooled and individual data of 4,854 firms with 57,134 firm-year observations in the years 1987 till 2000; companies in capital market-oriented economies (the U.K. and the U.S.) and bank-oriented economies (France, Germany, and Japan). Most firm-level data is taken from DataStream. M&A activity in each country stems from SDC platinum (Thomson Financial).	Two-step system-Generalized Method of Moments (GMM) procedure. Dependent variable: market leverage. Differentiation by firm size, growth opportunities, industry and sample year. General focus on financial markets with taxes as one of many influencing factors. Independent tax variables: effective tax rate, non-debt tax-shield.	The leverage ratio is positively affected by the tangibility of assets and the firm size, but declines with an increase in firm profitability, growth opportunities, and share price performance. The leverage ratio is also affected by the market conditions in which the firm operates, the economic environment and its institutions, corporate governance practices, tax systems, the borrower-lender relation, exposure to capital markets, and the level of investor protection.
Ayers, Cloyd, Robinson (2001)	Firm observations of US small- and medium-sized companies. The cross-section focuses on the year 1993.	The identification is based on the differing tax treatment of different legal forms and differing firm-specific marginal tax rates before interest deduction.	Irrespective of the firm's legal form, the interest expense for bank loans increases due to an increased tax rate; the interest expense for shareholder loans is influenced by a rising tax rate only regarding corporations, but not regarding partnerships.
Barclay, Heitzman, Smith Jr. (2012)	Firm data from the real estate industry in the years 1987 till 2010 based on CRSP/Ziman Real Estate Data Series. 1,025 (2,891) firm-year observations	Comparison between the leverage decisions across taxable and non-taxable real estate firms. Thus, the tax benefit of debt can be identified with little error. Dependent variables are several debt measures	Confirming the tax hypothesis, based on firms with similar asset portfolios, taxable firms have more debt than their non-taxable counterparts. Leverage ratios of taxable real estate firms relative to the control group are about 5% higher.

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	for taxable and 2,891 observations of non-taxable real estate firms.	relative to the market value of assets, independent variables are the taxable dummy, industry characteristics and (inter)nationalization.	
Barion, Miniaci, Panteghini, Parisi (2010)	European firm-level data of limited companies and limited liability companies taken from the AMADEUS dataset by Bureau van Dijk. The unbalanced panel covers 12,301 subsidiaries observed in a time window of 14 years.	Ordinary least squares and fixed-effect estimations with two different samples (overall vs. only linked subsidiaries). Dependent variable: leverage ratio of the respective subsidiary. Independent variables: Ultimate owner tax rate, subsidiary tax rate, company's liability, losses in previous periods, and return on assets in previous periods.	Subsidiaries' leverage increases with the statutory tax rate, levied in the country where it operates. The higher the parent company tax rate, the lower this positive effect. Furthermore, an increase in the parent company's tax rate is estimated to raise its subsidiaries' leverage.
Bartholdy, Mateus (2008)	Samples of up to 155,401 observations of 19,752 unlisted small and medium enterprises in 38 European countries for the period 1994 till 2004 stemming from the AMADEUS dataset by Bureau van Dijk.	Examination of to what extent characteristics and institutional factors affect corporate debt policy in small- and medium-sized enterprises (SMEs). Dependent variable: debt level of the firm. Instrumental variable estimation with the second lag of the dependent variable in order to regard its endogeneity. Major independent variables: tax dummy, effective tax rate, tangibility, firm age, macro controls.	The results demonstrate that the traditional financing theories, developed to apply to large listed firms, appear to hold for SMEs in an international setting. As expected, the impact in debt levels of firm's negative earnings is negative. If a firm has negative earnings this results in a 3.72 percent decrease in the firm's average debt level. Firm size is positively related to debt levels and statistically significant at the one percent level. A ten percent increase in depreciation per total assets brings a 5.50 percent decrease in a firm's debt level.
Bernasconi, Marenzi, Pagani (2005)	Firm observations of Italian firms covering the years 1993 till 2000. Small panels based on each tax reform are applied.	Italian tax reforms are used as natural experiments. Being affected by a reform depends on company characteristics such as tax credits or low tax rates on interest from equity.	If tax credits are available, less debt is applied. The same applies if the relative advantage of debt as compared to equity is reduced.
Blaufus, Lorenz (2009)	77,464 German corporations from the Dafne database by Bureau van Dijk, covering the years 2004 till 2007.	Identification of how many and what kinds of firms are potentially affected by the German interest barrier, which has been introduced as of 2009. Insightful and ample descriptive section followed by regressions. Dependent variable: potentially affected	561 to 1,511 of the analyzed 77,464 companies might be affected by the new interest barrier. This corresponds to 0.7% to 1.9% of all firms. The probability of being affected by the interest barrier increases with the following aspects: being a holding, being

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		by the interest barrier or not. Independent variables: characteristics relevant for the interest barrier, such as rentability, balance sheet total and financial leverage.	unprofitable, having a higher systematic debt risk, having a higher tax advantage of debt, firm size, collateral, having a smaller operative risk and a smaller internal financing.
Blouin, Core, Guay (2010)	157,513 firm-year observations of North American companies stemming from the Compustat database, covering the years 1980 till 2007.	An ample and insightful section of descriptive graphs and statistics is followed by ordinary least squares regressions which apply effective marginal tax rates following Graham (2000). Dependent variable: positive net benefits from doubling debt. Independent variables: book leverage, debt/value, return on assets, firm age, volatilities, non-debt tax shields.	The paper opposes the claim that many corporations are underleveraged in that they fail to take full advantage of debt tax shields. It shows that additional debt would provide firms with much smaller tax benefits than previously thought. When expected, distress costs and difficult-to-measure non-debt tax shields are also considered, it appears plausible that most firms have tax-efficient capital structures.
Buettner, Overesch, Schreiber, Wamser (2009)	German Federal Bank's Microdatabase Direct Investment (MiDi) providing 40,300 observations of 4,115 firms in the years 1996 till 2003.	Analysis of the tax influence on the capital structure of foreign affiliates. Dependent variables, applied one by one: share of external debt and share of internal debt. Independent variables: statutory tax rate, lending rate, loss carryforward, turnover, industry fixed-effects.	While taxes are found to encourage debt financing in general, adverse local credit market conditions result in lower external borrowing but higher internal debt indicating that the two channels of debt financing are substitutes.
Buettner, Overesch, Schreiber, Wamser (2012)	Microdatabase Direct Investment (MiDi) outbound side providing 42,950 firm observations from 36 countries in the years 1996 till 2004.	Innovative measure in form of a specific safe haven debt-to-equity variable to make the thin capitalizations of several countries comparable. Dependent variables, applied one by one: parent debt ratio, internal debt ratio, external debt ratio. Independent variables: existence of thin cap rule, tightness of the thin cap rule, tax rate, interaction terms of the aforementioned variables, loss carryforward, and tangibility.	Thin-capitalization rules effectively reduce the incentive to use internal loans for tax planning but result in higher external debt. If a host country with a tax rate equal to the sample average of 34% implements a tight thin-capitalization rule, denying interest deductions for debt exceeding a debt-to-equity ratio of 2:1, the ratio of internal debt declines by almost 12% or 24%, depending on how the thin-capitalization rule is denied.
Buettner, Wamser (2009)	Outbound side of the German Federal Bank's Microdatabase Direct Investment (MiDi) providing 128,892 firm observations from 174 countries in the	The identification is based on bilateral tax rate differences. Dependent variable: internal-debt ratio related to loans from other non-German affiliates. Major independent variables: tax rate differential, statutory tax rate, loss carryforward, sales,	The empirical results confirm a robust impact of tax rate differences within the multinational group on the use of internal debt, supporting the view that internal debt is used to shift profits to low-tax countries. Based on the small size of the tax effect, however,

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	years 1996 till 2005.	and tangibility.	other strategies to shift income to low-tax countries seem to be relatively more important.
Byoun (2008)	The samples used in the paper consist of up to 100,339 firm-year observations with data stemming from Compustat and covering the years 1972 till 2003.	Broad descriptive section followed by regressions using ordinary least squares estimations, an IV approach and a mixed-effects model. The dependent variable is the total (long-term) debt divided by book (market) value of assets. Independent variables: industry median debt ratio based on the two-digit SIC, marginal tax rate, operating income divided by total assets, market-to-book ratio of assets, and log of book value of total assets.	The main question traced in the paper is how and when firms align their capital structures towards the targets when acquiring other firms. Most adjustments seem to occur when firms have above-target (below-target) debt with a financial surplus (deficit). The tax effect is tested as well. It turns out that the marginal tax rate has a negative effect on leverage.
De Jong, Kabir, Nguyen (2008)	The Compustat Global database provides observations of nearly 12,000 firms from 42 countries around the world covering the years 1997 till 2001.	Cross-country summary statistics show the general trends. The estimations section presents the results of firm-level ordinary least squares regressions with leverage as the dependent variable and country's firm-specific factors as explanatory variables for each of the 42 countries. Some of the most important independent variables are tangibility, firm risk, firm size, and the average tax rate.	First, firm-specific determinants of leverage differ across countries, while prior studies implicitly assume equal impact of these determinants. Second, there is still an indirect impact because country-specific factors also influence the roles of firm-specific determinants of leverage.
Desai, Foley, Hines (2004)	Confidential firm-level data of about 30,000 affiliates belonging to 3,700 U.S. multinational companies. The data stems from the International Investment Division, Bureau of Economic Analysis, U.S. Department of Commerce and it covers the three year waves 1982, 1989 and 1994.	Analysis of the capital structures of foreign affiliates and internal capital markets of multinational corporations. Dependent variables, applied one by one: interest rate on non-trade account borrowing; ratio of affiliate current liabilities and long-term debt to total affiliate assets; ratio of affiliate current liabilities and long-term debt less trade accounts and trade notes payable to total affiliate assets. Central independent variables: country tax rate, creditor rights, EBITDA/assets, sales,	Ten percent higher local tax rates are associated with 2.8% higher debt/asset ratios, with internal borrowing being particularly sensitive to taxes. Multinational affiliates are financed with less external debt in countries with poor capital markets or weak creditor rights. Instrumental variable analysis indicates that greater borrowing from parent companies substitutes for three-quarters of reduced external borrowing induced by capital market conditions. Multinationals seem to employ internal capital markets opportunistically to overcome imperfections in

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		political risk.	external capital markets.
Desai, Foley, Hines (2008)	Panel firm-level data on US multinational companies, provided by the International Investment Division, Bureau of Economic Analysis, US Department of Commerce. The years 1982 through 1999 are covered.	Analysis of multinationals' exposure to political risk and their resulting incentives to adjust the capital structure. Dependent variable: the standard deviation of a foreign affiliate's annual return on assets for periods between benchmark surveys. Central independent variables: political risk, leverage, and basic country characteristics.	Returns on investment in politically risky countries are more volatile than returns elsewhere. Multinational firms reduce their leverage in response to these political risks: a one standard deviation increase in foreign political risk is associated with a by 3.5% reduced leverage. The effect is most pronounced for firms which are very exposed to political risk.
Dischinger, Glogowski, Strobel (2010)	AMADEUS database by Bureau van Dijk with 248,859 observations of 44,875 affiliates from 30 European countries in the years 1998 till 2006.	Endogeneity concerns on firm-specific risk proxies with a sector analysis comparing high-risk with low-risk industries based on exogenous information. Dependent variable: debt/assets; central independent variables: tax rate, tax differential, affiliate and country controls.	First, the debt-to-assets ratio is positively affected by the statutory corporate tax rate. Second, multinational subsidiaries use debt shifting with the parent and external debt to benefit from depreciation tax shields. Third, subsidiaries with a high firm-specific risk are more involved in debt shifting than low-risk subsidiaries. Vice-versa, low-risk affiliates use external debt more intensively.
Dwenger, Steiner (2009)	Pseudo-panel constructed from the corporate income tax return statistics and provided by the German Federal Statistical Office for the period 1998-2001. Descriptives are based on 701,971 (for 1998) and 809,641 (for 2001) observations, the pooled regressions build either on 1,029 or on 515 observations.	Estimation of the impact of effective profit taxation on the financial leverage of corporations. Dependent variable: financial leverage, measured by the ratio of long-term debt to total capital. IV approach, to regard endogeneity of the effective corporate tax rate as the most important independent variable. The micro-simulated counterfactual tax rate a corporation would face in a particular period had there been no endogenous change of its financial structure serves as the instrument.	Positive effect of the tax rate on corporate leverage: on average, an increase of the tax rate by 10 percent would increase the financial leverage by about 5 percent. The debt ratio is less responsive for small corporations and for corporations that benefit from various other forms of tax shields, in particular depreciation allowances and tax loss carry-forward.

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Egger, Eggert (2010)	Data from 32,067 European firms derived from Bureau van Dijk's AMADEUS database and covering the years 1996 and 2004.	Comparison of domestically and foreign-owned plants with respect to their debt-to-assets ratio. Analysis of to which extent the difference is systematically affected by corporate taxation.	Foreign-owned firms on average exhibit a significantly higher debt ratio than their domestically-owned counterparts in the host country. The average difference in the debt-to-assets ratio between foreign-and domestically-owned firms amounts to about 1.7 percentage points. An increase in the statutory corporate tax rate by 1 percentage point leads to an increase in the debt ratio of about 0.7 percentage points.
Feld, Heckemeyer, Overesch (2011)	Evidence from 46 previous studies on taxes and capital structure choice. The evaluated and analyzed primary studies stem from the years 1994 till 2010 and are based on 20 different databases.	Meta study, i.e. a quantitative synthesis of previous primary research on the topic. The basic sample builds on 1,012 semi-elasticities. Ordinary least squares and weighted least squares estimation approaches are applied in a parallel manner.	The meta study concludes that measures like the simulated marginal tax rate following Graham avoid a downward bias in estimates for the debt response to tax. Moreover, debt characteristics, econometric specifications, and the set of control variables affect tax effects. Accounting for misspecification biases by means of meta-regressions, the predicted marginal tax effect on the debt ratio is 0.3.
Gentry (1994)	Firm-level data of US corporations, covering the years 1987 till 1988.	Taxation of the interest on equity differs, depending on the respective firm's legal form, especially when also regarding the shareholder level.	Corporations, whose interest on equity is taxed both on the firm level and on the shareholder level, show a higher leverage than partnerships. This results from partnerships being transparent from a tax point of view and thus being taxed lower on the interest on equity.
Gordon, Lee (2007)	Corporate and personal tax return data from the U.S. Statistics of Income (SOI) as well as an individual model file. The latter is a stratified sample of individual tax returns in the United States, made available for research purposes by the Internal Revenue Service. The Consolidated sample covers 42 years from 1954 through 2000,	Analysis of the combined effect of nominal interest rates and taxes on the use and maturity structure of corporate debt. Year dummies are deliberately excluded in order to identify more clearly the role of interest rates. OLS estimations. Dependent variable: the average debt per firm of a given maturity over average capital per firm among all firms in a given size category. Key independent variables: interaction terms covering tax rates, interest rates and quartile dummies.	Behavioral responses regarding the leverage are larger when interest rates are higher. This can be explained by the proportionality of the tax gain from use of corporate debt to nominal interest rates. For similar reasons, firms shift towards more long-term debt as long-term rates rise relative to short-term rates.

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	excluding 1962 and 1966–1969. With 12 asset categories on average per year, the paper ends up with 489 usable observations.		
Graham (1996)	US firm observations stemming from the Compustat database and covering the years 1980 till 1992.	Elaboration on the differences in company-specific tax burdens influenced by tax credits, losses and a progressive tax scale; the changes in capital income taxation over time are also analyzed.	If the company-specific marginal tax rate increases by ten percentage points, the leverage increases by 0.69 percentage points.
Graham (1999)	Compustat sample with 65,429 US firm observations over the years 1980 till 1994. The mean (median) debt-to-value ratio in this sample is 21.3% (17.7%) over the sample period.	Investigation of the degree to which personal taxes affect corporate financing decisions and therefore counterweigh the impact of the corporate income tax. Cross-sectional regressions which control for personal taxes.	Debt usage is positively correlated with tax rates in each year 1980–1994, with significant coefficients in almost every year. A specification that adjusts tax benefits for the personal tax penalty statistically dominates a specification that does not. The positive (negative) effect of corporate (personal) taxes on debt usage is distinctly identified.
Graham (2003)	Overall analysis of the general findings in 51 papers which mainly stem from the four decades between about 1960 and 2010.	A review of tax research related to domestic and multinational capital structure, payout policy, compensation policy, risk management, and organizational form. The related empirical evidence is summarized and discussed, but there is no quantitative meta-analysis applying regressions.	There is a general support of the hypothesis that high tax rate firms pursue policies that provide tax benefits. Despite a careful review of the literature (up to 2003), many issues are considered unresolved. Examples include understanding whether tax effects are of first-order importance, why firms do not pursue tax benefits more aggressively, and whether corporate actions are affected by investor-level taxes.
Graham, Lemmon, Schallheim (1998)	The Compustat database provides US firm observations covering the years 1981 till 1992.	Elaboration on the differences in company-specific tax burdens influenced by tax credits, losses, and a progressive tax scale; different utilization of leasing options.	If the company-specific marginal tax rate increases by ten percentage points, the leverage ratio increases by 0.74 percentage points. The relative share of operating leases decreases as a consequence of an increasing company-specific tax rate.

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Green, Murinde (2008)	Balanced panel consisting of the published accounts of 97 unquoted Indian companies, which reported continuously during 1989 till 1999.	Empirical analysis of the impact of tax policy on the financial decisions of a sample of unquoted companies in India during the period 1989 till 1999. The model is estimated using Generalized Methods of Moments (GMM).	A conventional model seems to work well in explaining the leverage ratios of unquoted non-financial Indian companies. Effective tax rates and non-debt tax shields have a significant and plausible impact on financing decisions. The 1990's Indian tax reforms seem to have had a substantial impact in reducing outstanding unquoted company debt.
Huang, Ritter (2009)	Firm-level data derived from the Center for Research in Security Prices (CRSP) and Compustat. The years 1963 till 2011 are covered, with 129 US firm observations in 1963 and 4,160 US firm observations in 2001. The estimations are based on between 44,630 and up to 111,413 observations.	Broad descriptive graphs and statistics showing the aggregated trends across the four decades. They are followed by thorough regressions. Besides general OLS estimations with and without firm-fixed effects, there is a nested logit model approach for joint decisions.	The paper generally traces capital structure choices and especially estimates the speed of adjustment. Taxes are just one of many influencing factors. Clearly, the statutory corporate tax rate and is negatively correlated with the real interest rate. Inconsistent with the static trade-off theory that views the tax rate as a major factor in the decision to issue debt, the tax rate has only a secondary effect on the propensity to issue debt or equity.
Huizinga, Laeven, Nicodème (2008)	AMADEUS ownership database provided by Bureau Van Dijk, applied to match European firms with their domestic subsidiaries and subsidiaries located in other European countries. The sample consists of 13,307 affiliates belonging to 5,791 parent companies and traced from 1994 till 2003. This results in 38,736 parent-year observations and 90,599 subsidiary-year observations.	Rich section of descriptive tax input data presentation, showing for 32 European countries the profit tax rates, the bilateral withholding tax rates on interest and on dividends, and the respective bilateral credit methods. OLS regressions with parent-, industry-, and year-fixed effects. Dependent variable: subsidiary's simple and adjusted financial leverage; central independent variables: effective marginal tax rate, tax incentive for debt shifting, tangibility, and country controls.	A foreign subsidiary's capital structure reflects local corporate tax rates as well as tax rate differences relative to the parent firm and other foreign subsidiaries. The overall economic effect of taxes on leverage, however, appears to be small. An increase of the effective tax rate by 0.06 in the subsidiary country has a positive 'international' effect on leverage in the subsidiary country of 0.7%. Ignoring the international debt shifting arising from differences in national tax rates would understate the impact of national taxes on debt policies by about 25%.

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Kesternich, Schnitzer (2010)	Outbound side of the Microdatabase Direct Investment (MiDi) provided by the Deutsche Bundesbank. The limited sample applied for the estimations is based on 186,952 subsidiary observations from the years 1996 till 2006.	Analysis of how multinational firms choose the capital structure of their foreign affiliates in response to political risk. Variables of choice are the leverage and the ownership structure of the foreign affiliate. Political risk is assumed to consist of expropriation, unreliable intellectual property rights and confiscatory taxation. OLS regressions including parent-, year- and industry-fixed effects. Dependent variables applied one by one: leverage, ownership. Central independent variables: political risk, statutory tax rate, and country controls.	As political risk increases, the ownership share tends to decrease, whereas leverage can both increase or decrease, depending on the type of political risk. Any form of political risk negatively affects the profitability of an MNE as a whole. The effects are, however, less straightforward for debt holders because they adjust their interest rates if expecting the debt service to become less likely.
Klapper, Tzioumis (2012)	All private, unconsolidated, non-financial, non-state-owned Croatian firms that are available in Bureau van Dijk's AMADEUS dataset. The unbalanced panel consists of 58,752 observations from 14,431 firms during the years 1998 till 2003.	Analysis of tax effects on financing policy using the corporate tax reform in 2001 in Croatia as a quasi-natural experiment. OLS regressions, system GMM estimators and differences-in-differences estimations. Dependent variable: transformed equity-to-asset ratio; central independent variables: EATR, sales, current ratio, and tangibility.	Consistent with the trade-off theory of capital structure, lower taxes have affected the capital structure of Croatian firms, resulting in increased equity levels. The 11.4 percent EATR reduction from the corporate tax reform is associated with an average 1.7 percent increase in the equity portion of private firms' capital structure.
Lemmon, Roberts, Zender (2008)	Non-financial firm-year observations taken from the annual Compustat database covering the years 1965 and 2003. There is a so-called survivor subsample of firms having at least 20 years of non-missing data on book leverage. The (sub)sample consists of (92,306) 225,839 observations of US firms. Variances are explicitly decomposed.	Panel OLS regressions with several different specifications. Dependent variables, applied one by one: book leverage, market leverage. Central independent variables: initial leverage, sales, profitability, and tangibility.	The majority of variation in leverage ratios seems to be driven by an unobserved time-invariant effect that generates surprisingly stable capital structures: High (low) leveraged firms tend to remain as such for over two decades. This previously disregarded feature of leverage, which is robust to firm exit, and is present prior to the IPO, suggests that variations in capital structures is primarily determined by factors that remain stable for long periods of time.

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MacKie-Mason (1990)	Firm-level data of US corporations, covering the years 1977 till 1987.	The financing decision of one additional investment project is analyzed. Special attention is devoted to the fact that marginal tax rates are strongly influenced by tax loss carryforwards and tax credits.	The higher an existent tax loss carryforward of a firm, the lower is its probability to take up debt for the financing of a new investment project. The probability of debt financing also decreases once there is a threat that tax credits could not be used.
Mills, Newberry (2004)	Tax data provided by the Internal Revenue Service, presenting US subsidiaries of groups based in 16 different countries. The years 1987 till 1996 are considered.	The international tax rate variation of the investor countries is used for identification.	A ten percentage point increase in the difference between the US tax rate and the tax rate of the group's home country causes the debt ratio to increase by 4.9 percentage points.
Newberry, Dhaliwal (2001)	Firm observations of US American companies having carried out bond issues. The subsidiaries observed in the time span 1987 till 1997 are located in the G7 states.	The difference in the US mother company's tax status (loss carryforward, excess tax credit) is used for identification. The key binary independent variable distinguishes if the tax rate in the subsidiary's country is higher or lower than the one in the USA.	The probability of issuing a bond abroad amounts to 47% if the US parent company does not have a loss carryforward; in the other case it is 94%. An increase in the excess tax credit by 10 percentage points increases the probability of bond issuance abroad to 54%. The higher the tax rate abroad relative to the US profit tax rate, the higher the probability of a bond issuance abroad.
Overesch, Voeller (2010)	Unbalanced panel of European firm-level data taken from the AMADEUS database provided by Bureau van Dijk. Regressions are based on 3,155,765 firm observations, spreading across 23 European countries and covering the period 2000 to 2005.	Analysis of to what extent personal and corporate taxation has an influence on companies' capital structure decisions. Hypotheses are primarily based on the different tax treatment of debt and equity. Dependent variable is the debt-to-capital ratio. Central independent variables are the tax rate, tangibility and a loss carryforward dummy.	A higher tax benefit of debt has the expected significant positive effect on a company's financial leverage. The capital structures of smaller companies respond more heavily to changes in the tax benefit of debt. Variations in capital income tax rates at the shareholder level imply significant capital structure adjustments. Finally, there seems to be a substitutive relationship between non-debt tax shields and the effect of the corporate tax rate on capital structure.
Overesch, Wamser (2010)	Inbound side of the Microdatabase Direct Investment (MiDi) by the German Federal Bank, covering the years 1996 till 2004. The	Analysis of tax-planning behavior by means of inter-company finance and the effectiveness of government countermeasures via thin-capitalization rules. Legal amendments are used as natural experiments for	Significant impact of tax-rate differentials on the use of inter-company debt. Thin-capitalization rules induce significantly lower internal borrowing. Thus, tax planning via internal financing is effectively limited by thin-

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	regressions are based on up to 19,379 subsidiary observations.	evaluating the effectiveness of the German thin-capitalization rule. Dependent variable: share of inter-company loans borrowed from the foreign parent company; central independent variables: tax rate differential, group's tax rate, turnover, and a loss carryforward dummy.	capitalization rules.
Pfaffermayr, Stoeckl, Winner (2009)	Cross-section of some 405,000 firms from 35 European countries and 126 NACE 3-digit industries, stemming from Bureau van Dijk's AMADEUS database and covering the years 1999 till 2004.	Analysis of causal relationships between corporate taxation, firm age and debt. Dependent variable: debt to asset ratio; Central independent variables: statutory corporate tax rate, firm age and an interaction of firm size, tangibility, and profitability.	A firm's debt ratio increases with the corporate tax rate. Moreover, older firms exhibit smaller debt ratios than their younger counterparts. Finally, there seems to be a positive interaction between corporate taxation and firm age, indicating that the impact of corporate taxation on debt is increasing over a firm's life-time.
Ruf (2010)	Regressions are based on 137,697 subsidiary observations stemming from the MiDi-Database provided by Deutsche Bundesbank and covering the years 1996 till 2007.	OLS estimations including parent- and year-fixed effects. Dependent variable: total debt divided by total assets, Central independent variables: profitability, subsidiary size, tangibility, and country macro controls.	Only one third of the standard increase in subsidiary leverage with the tax rate is due to a trade-off behavior of multinationals between the tax benefits and the cost of using debt. The remaining two thirds are due to the pecking order. In total, a ten percentage point increase in the tax rate causes a 4.45 percentage point increase in subsidiary leverage.
Ruf (2011)	Inbound case of the MiDi database provided by the Deutsche Bundesbank. The regressions build on up to 72,558 observations of multinationals' German subsidiaries, covering the years 1996 till 2006.	OLS estimations including year dummies, industry dummies, and subsidiary fixed-effects. The dependent variable is the leverage, defined as total liabilities divided by the balance sheet total. Key independent variables are the tax rate, a firm-size dummy variable, an interaction term of these two variables, tangibility, and country controls.	Elaboration of possible explanations for why empirical studies have found a quite moderate response of multinationals' capital structure to tax incentives. Firstly, previous studies may have overlooked the importance of holding companies. Secondly, international transfer pricing guidelines may reduce the tax incentives for debt financing. No evidence, however, that debt as a tax planning tool might be used especially by large multinationals.

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Trezevant (1992)	US American firm-level data from the years 1979 till 1982.	Natural experiment based on the US tax reform of 1981, which provided more generous depreciation allowances. Analysis of to what extent the accelerated depreciation is used to lower the tax payment.	Only at firms already showing a decent average tax burden beforehand could the new accelerated depreciation effectively further reduce tax expenses.
Wamser (2008)	Microdatabase Direct Investment (MiDi) provided by the Deutsche Bundesbank. Specific focus on the year 2001 in both the descriptive section and in the estimations.	Analysis of how multinational enterprises respond to a restriction on interest deductions incurred for internal borrowing. Propensity score matching techniques. The 2001 reform of the German thin capitalization rule is used to solve endogeneity problems.	Restrictions on internal debt are associated with expansions in external debt finance, indicating a substitution relationship. A treated subsidiary increases its external-debt-to-capital ratio by about 2.5 percentage points relative to the counterfactual outcome. In terms of the stock of external borrowing, treatment is associated with around 8% more external debt.

6. The Impact of Tax Treaties and Repatriation Taxes on FDI Revisited^{55 56}

Abstract: I revisit the effects of double tax treaties on foreign direct investment (FDI). Previous empirical studies provide somewhat counterintuitive results suggesting insignificant or even negative effects of tax treaties. Using firm-level data provided by the German Central Bank I analyze the investment impact of double tax treaties and repatriation taxes between 58 countries throughout a 13-year period from 1996 till 2008. While a simple binary variable indicating a treaty reform is not sufficient for identification, a closer look at the size of the change in repatriation taxes reveals a negative impact on investments in fixed assets. Considering that tax treaties can significantly cut repatriation taxes, my results suggest that the puzzle can be explained in line with theoretical predictions regarding the influence of dividend taxes on investment decisions. Further inspection reveals that repatriation taxes have a positive impact on financial assets. The significant opposing effects net out and leave an insignificant total effect. Regarding capital structures, I find that nominal capital shrinks but revenue reserves increase with higher repatriation taxes.

Keywords: Corporate Taxation, Double Tax Treaties, Repatriation Taxes, Empirical Analysis, Foreign Direct Investment, Multinational Firms

JEL Classification: F23, H25, H32

⁵⁵ This paper is joint work with Professor Dr. Michael Overesch. In 2011, the paper has been presented at the 67th Congress of the International Institute of Public Finance (IIPF) in Ann Arbor. In 2012, it has been presented at the Workshop on Current Research in Taxation in Muenster.

⁵⁶ I would like to thank the Deutsche Bundesbank for granting access to the MiDi database and Dhammika Dhamapala and Ron Davies for helpful comments. Financial support by the German Science Foundation (DFG) is gratefully acknowledged.

6.1 Introduction

Multinational companies invest in their subsidiaries all over the world. There are several reasons for the increase of foreign direct investments (FDI) over the last decades. Most of them come down to the argument of lower transaction costs. In this paper, I work out how the improved coordination concerning taxation affects FDI. In particular, I revisit the impact of tax treaties and, in particular, repatriation taxes on FDI.

In a lack of coordination, cross-border profit distribution of a subsidiary can be taxed twice. Distributed profits are taxed by the country hosting the subsidiary and, thereafter, by the country of the parent company when they are repatriated. In order to release companies from double taxation, states enter into bilateral double tax treaties. Double tax treaties translate the aspect of international coordination to the area of taxes.⁵⁷ Besides other aspects, a tax treaty allocates the claims to tax the same income, limits the tax rates imposed by source countries and defines a method to avoid double taxation. In particular, tax treaties define what percentage of distributed dividends the host country is allowed to keep as a withholding tax and how the dividends are taxed at home.

During the last decades, hundreds of double tax treaties have been concluded or amended and many of them lowered the permissible tax imposed on transactions between the respective countries. I combine this extensive institutional variation with a rich micro-level data set of German multinationals active in more than 50 host countries. In particular, I have detailed information on the chains of ownership. Moreover, I can use the fact that Germany has one of the most extensive tax treaty networks all over the world and always stipulates the exemption of foreign dividends from home country taxes. This data allows me to identify double tax treaties, withholding tax rates and the effective tax on repatriations between more than 3,000 country pairs over a period from 1996 till 2008.

I provide evidence suggesting that repatriation taxes indeed significantly affect investments of multinational subsidiaries. My results oppose to the finding of earlier and more general studies stating a negative impact of tax treaties on investment. While double tax treaties are expected to increase FDI, surprisingly, this general effect does not appear in several previous empirical studies. Blonigen and Davies (2004) find mostly insignificant and even some negative effects of the existence of a double tax treaty in aggregated data on US inward and

⁵⁷ In this paper, I focus on double taxation treaties and do not regard effects of bilateral investment treaties on FDI. For a discussion of bilateral investment treaty effects see Salacuse and Sullivan (2005), Neumayer and Spess (2005) and Egger and Pfaffermayr (2004).

outward FDI. Davies (2003) considers US FDI data from 1960s and 1970s and also finds a negative response to tax treaties and mixed results for tax treaty amendments. Louie and Rousslang (2008) make another attempt to identify effects of US tax treaties but also fail to find statistically significant effects. Egger, Larch, Pfaffermayr and Winner (2006) consider outward FDI stocks of OECD countries. Yet, their results again suggest a significant *negative* impact of newly implemented tax treaties on FDI stocks.

The insignificant or even negative effects are usually explained by a supposed treaty-induced reduction of tax evasion practices (see, e.g., Blonigen and Davies, 2004). Despite ongoing empirical analyses of tax evasion, this argument is not fully convincing in the tax treaty context. Regarding the rules to monitor transfer prices, national tax legislation of OECD countries and many other countries already refer to the arm's length principle to assess transfer prices irrespective of any double tax treaty. Concerning the effects of enhanced information exchange, it is also not entirely clear whether this fact really is to be associated with significant additional tax payments in the particular case of FDI. While information exchanges clearly help to identify taxable transactions in the case of portfolio investment and capital investment by individuals, FDI is usually not completely invisible for tax authorities because investors have significant control in the investment projects and both the parent company and the subsidiary have to disclose financial accounts.

I, however, suppose that positive effects of tax treaties on FDI should outweigh any negative treaty effects. There already is evidence that withholding taxes and the method to avoid double taxation of foreign income significantly affect FDI. Hines (1996) finds that low tax US states are particularly attractive to investors from home countries which exempt foreign income compared to investors from credit countries. Similarly, a study by Egger, Loretz, Pfaffermayr and Winner (2009) finds a significant effect of host country taxes on bilateral FDI among OECD countries if the home country applies an exemption system. In any case, both find a significant negative effect of withholding taxes on aggregated FDI stocks. Huizinga and Voget (2009) employ micro-data of M&A cases and find striking effects of repatriation taxes on both the direction of acquisitions and the number of acquired firms per country. Furthermore, Overesch and Wamser (2009) find negative effects of withholding taxes on location decisions of German multinationals.

Therefore, I test whether the puzzling results found in the literature correspond with theoretical predictions about the role of repatriation taxes on investment of subsidiaries. The early literature argues that investment is negatively affected by dividend taxes. Whereas

proponents of what is called the “New View” on corporate taxation show that repatriation taxes do not affect FDI if a corporation uses a reduction of its distributions as their marginal source of finance (King, 1974a, 1974b; Sinn, 1984; Hartman, 1985). In accordance with these models, repatriation taxes exert a negative effect only if new equity injection is the marginal source of finance, e.g., when a new subsidiary is founded (Sinn, 1993). Interestingly, some studies finding positive treaty effects analyze the external margin of FDI (Di Giovanni, 2005; Davies, Norbaeck and Tekin-Koru, 2009). Di Giovanni (2005) considers aggregated data on mergers and acquisitions (M&A) and finds a significant positive effect of a tax treaty. For Swedish firms, Davies et al. (2009) find a positive effect of new tax treaties on the probability to have a subsidiary in a certain host country while, conditional on the location choice, they are unable to identify any statistically significant tax treaty effect on sales.

I, however, contribute to the discussion of tax treaty effects and repatriation taxes by analyzing the internal margin of FDI. Moreover, my paper contributes to the literature by combining both the big picture approach and an analysis of many individual effects tax treaties and repatriation taxes are supposed to exert.

First, I analyze whether renegotiations of tax treaties exert significant effects on total investment of subsidiaries, but I am unable to find statistically significant results. Further inspection, however, reveals that the tax treaty puzzle can be well explained by effects of repatriation taxes on different investment decisions of multinational subsidiaries. I disentangle different kinds of investment and financing and execute detailed tests of the predictions brought forward in the previous literature. In doing so, I find that repatriation taxes negatively affect investment in fixed assets leading to the conclusion that retained earnings are not the marginal sources of finance. Apart from the significant effects of repatriation taxes, a new or renegotiated tax treaty does not seem to exert an additional significant effect on real investment.

If repatriation taxes vary over time, additional effects of repatriation taxes have to be considered. Blouin and Krull (2009) provide a simple model and empirical evidence regarding the response to the 2004 US tax holiday on repatriated dividends. Generally, it is very reasonable that multinationals expect falling repatriation taxes when taking into account the striking trend of cutting withholding tax rates if tax treaties are conducted or renegotiated. If subsidiaries expect a cut in repatriation tax rates, they should postpone repatriation. Desai, Foley and Hines (2007) and Bellak and Leibrecht (2010) find a negative tax impact on repatriations of US or German multinationals, respectively. Moreover, Foley, Hartzell,

Titman and Twite (2007) show that US multinationals hold extensive amounts of cash in foreign subsidiaries because repatriation will be taxed. Weichenrieder (1996) shows that capital market investments can be used to defer profit distributions. Altshuler and Grubert (2003) note that, in particular, buying shares of affiliates is a means to avoid repatriation taxes. While profitable local investment opportunities of the subsidiary are limited, investment in the capital market or in shares of other affiliated firms is independent from local investment opportunities. Consequently, the positive effect of repatriation taxes on retention should particularly appear in higher financial investments.

If FDI data does not allow differentiation between physical and financial investment, the effect of repatriation taxes on financial assets might dominate estimated effects, which in turn leads to the wrong conclusion that tax treaties generally exert a negative effect on FDI. One exception is the analysis by Millimet and Kumas (2007). They find some positive effects of tax treaties on FDI measures. In particular, the effect is more pronounced for observations succeeding the conclusion of a new double tax treaty by many years leading to the conclusion that negative effects of a new tax treaty might reflect repatriation of retained earnings.

In fact, I find a positive effect of repatriation taxes on financial investments. Moreover, I find corresponding evidence regarding the structure of equity finance. Higher repatriation taxes are associated with a significantly higher share of revenue reserves. This finding again supports the view that firms postpone repatriation because they have the general expectation that - owed to new tax treaties - high repatriation taxes will decrease in the future.

The remainder of the paper is organized as follows. In the next section I discuss effects of the institutional details of the international tax system and derive empirically testable hypotheses. Thereafter, the investigation approach is presented in Section 3. The data is presented in Section 4 and Section 5 presents empirical results. Finally, Section 6 concludes.

6.2 Development of Hypotheses

International business taxation significantly affects FDI. In particular, it is well known that the host country's corporate taxes negatively affect FDI (for an overview see DeMooij and Ederveen, 2003; Feld and Heckemeyer, 2011). Moreover, intercompany transactions are subject to source taxes in the host country and are considered as foreign income at the level of the parent company. Consequently, the taxation of these transactions is also expected to influence FDI.

6.2.1 Double Tax Treaties and FDI

A double tax treaty is an agreement between two countries on the taxation of income which has some taxable nexus with both treaty partners. Yet, a piece of national tax legislation determines a fiscal position, whereas a double tax treaty may only limit these claims. Consequently, the double tax treaty helps to coordinate the claims of each of the two involved national tax legislations. Moreover, double tax treaties coordinate the definition of terms and determine mutual agreement procedures.

Considering these functions, double tax treaties are expected to affect FDI of multinational firms. It is, however, unclear if double tax treaties increase or decrease FDI. On the one hand, double tax treaties are expected to be associated with additional FDI for the following reasons: elimination of double taxation, reduction of withholding taxes, standardization of terms and definitions, enhanced certainty about the tax environment, and elimination of double taxation of expatriates. On the other hand, the previous literature has argued that tax treaties might also negatively influence FDI because treaties refer to the arm's length principle to assess transfer prices, eliminate loopholes by enhancing the information exchange between the treaty partners, provoke additional repatriations by reducing withholding taxes, and prevent firms from setting up holding structures which aggressively exploit the international treaty network (see, e.g., Blonigen and Davies, 2004).

I argue that the rationales suggesting an adverse effect of tax treaties on FDI are not very convincing.⁵⁸ First, OECD countries as well as other countries already apply the arm's length principle to assess transfer prices on the basis of national tax legislation. Consequently, a tax treaty usually does not change the assessment of transfer prices.⁵⁹ Nevertheless, some tax treaties include specific rules on mutual agreement procedures in transfer pricing disputes. These rules, however, tend to avoid double taxation risk and might therefore be associated with more rather than less FDI. Second, information exchange does only contribute to closing loopholes if transactions are invisible to tax authorities. Yet, FDI is associated with significant control by investors. Parent companies and subsidiaries have to disclose many details in their financial accounts. Therefore, the effects of enhanced information exchanges are expected to

⁵⁸The explanation that tax treaties predominantly exert significant negative effects on FDI owing to transfer pricing rules and enhanced information exchange is also contradicted by evidence dealing with tax treaty effects on FDI in developing countries. While national tax legislation of developing countries might often lack sophisticated transfer pricing rules and clear definitions of terms, a study by Neumayer (2007) finds significant positive treaty effects on FDI in developing countries.

⁵⁹Details of arm's length transfer prices are defined by OECD transfer pricing guidelines (OECD, 2010). These guidelines came into force by national tax legislation and should not be mistaken as the OECD model convention.

be rather limited in the particular case of FDI. Third, rules to prevent firms from what is called treaty shopping only eliminate incentives which just arise from the fact that a treaty has been concluded.⁶⁰

In a nutshell, it seems to be a very reasonable conclusion that positive effects of tax treaties on FDI outweigh negative treaty effects. A total positive effect is also expected after a renegotiation of a tax treaty, because renegotiations are often associated with significant cuts in repatriation taxes. This leads to my first testable hypothesis:

H6-1: A new or a renegotiated tax treaty exerts a non-negative total effect on FDI.

6.2.2 Tax Treaties and the Effective Tax on Repatriation

I argue that the consequences of tax treaties for the taxation of FDI boil down to changes in repatriation taxes. In the following, let us consider the standard case of FDI in an incorporated subsidiary. Profits generated by an incorporated subsidiary are not subject to tax at the level of the parent firm as long as they are not distributed (deferral system). Sooner or later, however, a multinational firm will repatriate foreign profits and bring them to the sphere of disposability. A multinational firm has different means to repatriate profits,⁶¹ either by paying interest on previously provided intercompany loans, by paying royalties or by paying intercompany dividends. The latter can be considered the most important one in terms of volume and also in the potential sensitivity to tax treaty regulations.⁶² That is why I focus on repatriation via dividends in this paper.⁶³ Cross-border intercompany dividends can be subject to tax in the host country of the subsidiary paying the dividends (source country) as well as in the residence country of the firm receiving the dividends (home country). Without an effective treaty, double taxation is very likely. Either way, the taxes imposed on intercompany dividends reduce funds available for distribution to the shareholders.

Among the various aspects associated with a tax treaty, two issues directly affect the effective tax on repatriation. First, tax treaties limit the withholding rate imposed on intercompany dividends (Article 10 OECD Model Tax Convention). However, the tax treaty only affects the

⁶⁰ Anti-avoidance rules to prevent firms from treaty shopping might have an effect if these rules are introduced in the course of a renegotiation of an existing tax treaty. Then, FDI measures might be affected by some reorganizations of holding structures.

⁶¹ Altshuler and Grubert (2003) provide an overview of the repatriation strategies available to multinationals.

⁶² Tax treaties also limit the tax withhold if intercompany interest or royalties are paid. Tax savings by these means are, however, very unlikely because these types of income tax treaties or national tax legislation usually consider a credit system.

⁶³ Additional repatriation methods include inter-company interest payments or disposal of the subsidiary. Yet, the use of intercompany debt and disposal of share is rather limited, e.g. due to earnings stripping rules in the former case and the obvious end of the foreign activity in the latter case.

treatment of intercompany dividends if national tax legislation already claims a fiscal position in intercompany dividends. In this case, withholding taxes are only changed by a tax treaty if the cap imposed by the treaty is below the withholding tax rate already effective in the source country. Suppose, for example, a tax treaty which limits the withholding tax at a rate of 10 percent - the tax treaty would change the effectively imposed tax rate if the ordinary withholding tax rate defined by the national tax code was 15 percent. In contrast, the withholding tax would remain completely unaffected by the tax treaty if the withholding tax rate determined by the national legislation was only 5 percent. Moreover, tax treaties between member states of the European Union (EU) are very likely to have no material effect on withholding tax rates because the EU Parent-Subsidiary-Directive has already eliminated any withholding taxes imposed on intercompany dividends.

Second, tax treaties include an agreement on either the credit method or the exemption method to avoid double taxation of intercompany dividends at the level of the parent company (Article 23 OECD Model Tax Convention). However, national tax legislations also take into account that the repatriated profits have already been subject to withholding taxes and also to corporate taxes at the level of the subsidiary. If the exemption method is applied, repatriated intercompany dividends are tax exempt at the level of the firm which receives the dividends. Germany is one of the countries exempting intercompany dividends from taxation. In the case of a credit system, intercompany dividends are subject to tax but taxes paid abroad reduce the tax liability. The US are a prominent country applying a credit system.⁶⁴ If the tax rate of the residence country exceeds the tax credit, a reduction of withholding tax, e.g., caused by a new tax treaty, has no material effect. The interplay of a declining withholding tax and the credit system may also help to explain why the previous literature has often failed to find positive treaty effects.⁶⁵

Moreover, I have to consider the interplay between the tax treaty and the national tax legislation. A double tax treaty changing the method to avoid double taxation can significantly cut the effectively imposed repatriation tax. Yet, there are many cases where the method introduced by a tax treaty effectively leaves the repatriation taxes unchanged. The first case is an excess credit position. An excess credit arises if foreign taxes exceed the tax liability of the residence country on foreign income. If the excess credit cannot be used, e.g.,

⁶⁴ If a direct credit is applied, the foreign tax credit includes the withholding taxes imposed on intercompany dividends. An indirect credit also includes foreign corporate taxes paid by the subsidiary.

⁶⁵ In additional robustness checks, the study by Blonigen und Davies (2004), for example, comes up with several positive treaty effects on US inbound FDI, while no robust effects are found in the case of US outbound FDI. The latter results may hint at an offsetting effect of the US credit system and changes of withholding tax rates.

in subsequent periods, a credit system effectively equals the exemption system. In this case, introducing the exemption method does not effectively change repatriation taxes.

Secondly, if, for example, the tax code of the residence country already determines the exemption of intercompany dividends, the taxation of repatriated profits is effectively unchanged by a tax treaty referring to the indirect credit method. This is also true if the treaty refers to the same method which is already in force.

The discussion has shown that in conceivable cases tax treaties do not effectively change repatriation taxes. Please refer to the Appendix for a detailed description how the effective repatriation tax is calculated. I set up the following hypothesis:

H6-2: A new or renegotiated tax treaty exerts a positive effect on FDI if it has effectively changed the repatriation tax imposed on intercompany dividends.

6.2.3 Investment Effects of Repatriation Taxes

Concerning the effect on FDI I consider a change in repatriation taxes the most important aspect of double tax treaties. Therefore, I derive testable hypotheses for additional empirical analyses about the impact of repatriation taxes on FDI.

The traditional view on dividend taxes is deduced from the fact that taxes on dividend payments are an excess burden on corporate investment. Since investors anticipate this additional tax, cost of equity capital rises with the dividend tax (Harberger, 1962). If marginal rates of return on capital are declining, the optimal investment size is negatively affected by dividend taxes. The repatriation taxes imposed on intercompany dividends are a particular type of dividend tax. Consequently, this “old” view on corporate taxation predicts negative effects of repatriation taxes on FDI.

Yet, another strand of literature, dealing with the so-called “new” view on corporate taxation, predicts insignificant effects of repatriation taxes and, thus, of tax treaties. Starting with the seminal works by King (1974a, 1974b) and Auerbach, (1979, 1983), this literature suggests that dividend taxes do not affect investment if a corporation can use retained earnings as their marginal source of finance. Unlike the Old View, these models consider the fact that dividend taxes can be deferred by retaining and reinvesting earnings within the corporation. As repatriation taxes, like withholding taxes or home country taxes on foreign income, are usually imposed on distributed income rather than on accruals, Hartman (1985) and Sinn (1984) apply these arguments to repatriation taxes on international intercompany dividends.

Proponents of the New View assume that dividend taxes only have a negative impact on investment if new equity injection is the marginal source of finance. I set up the following hypothesis:

H6-3: *Repatriation taxes exert a significant negative effect on FDI if new equity is the marginal source of finance. If subsidiaries use retained earnings as their marginal source of finance, repatriation taxes do not significantly affect FDI.*

6.2.4 Repatriation Taxes and Retentions

Applying the logic of the New View to repatriation strategies of the multinational firm suggests that repatriation taxes do not affect the timing of repatriations if current tax conditions are not expected to change over time. The rationale for this result is the following: Repatriation taxes do not affect the marginal investment decision because the subsidiary has to pay these taxes irrespective of whether it reinvests the profits or distributes them right away.

Empirical studies show that firms smooth their repatriation payments over time (Desai, Foley and Hines, 2007; Bellak and Leibrecht, 2010). Desai et al. (2007) argue that intercompany dividends can be quite well explained by agency conflicts between local managers and the central management of the firm, financial constraints of the multinational group and last but not least by the incentive that, in turn, the multinational firm has to pay smooth dividends to its external shareholders.

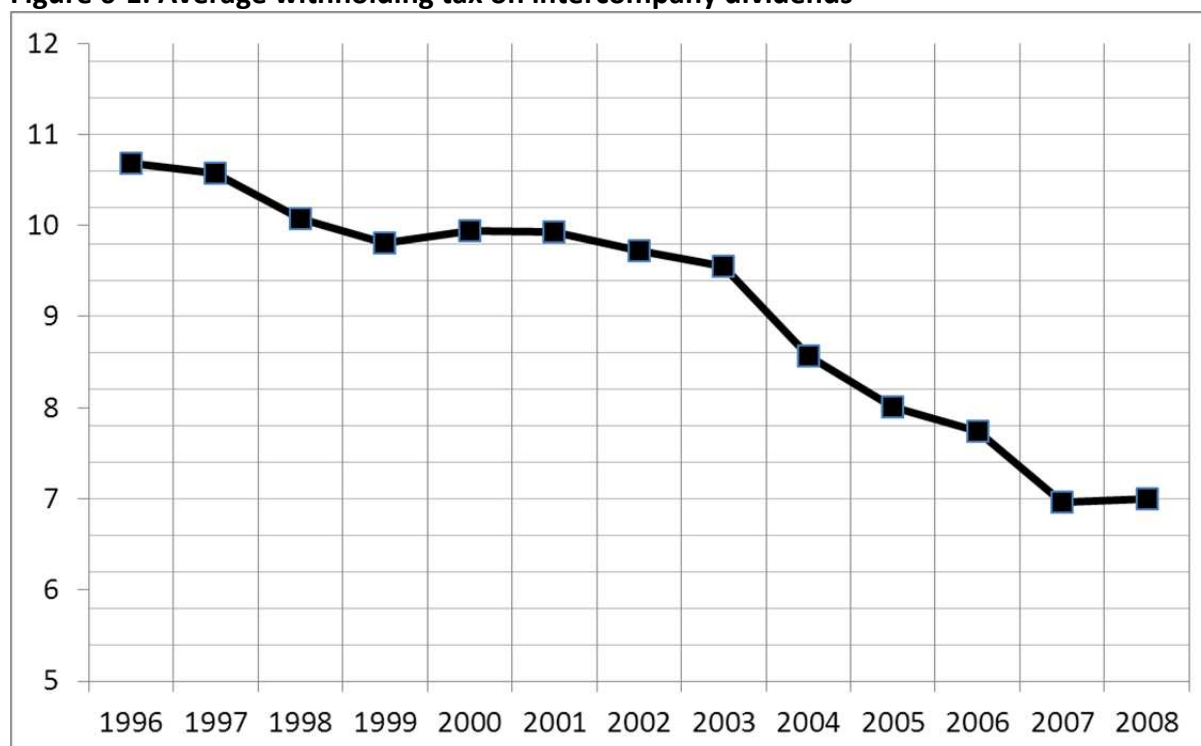
Previous results also suggest that repatriation taxes affect repatriations (Desai et al. 2007; Bellak and Leibrecht, 2011). The most convincing explanation for an impact of repatriation taxes is the expectation that withholding taxes and home country taxes on foreign income vary over time. Then, repatriation taxes are, of course, no longer irrelevant for the decision whether to retain or to repatriate foreign income. The expectation of varying repatriation taxes was, for example, fulfilled for US multinationals in 2004 and 2005, when the US government offered a temporary reduction in US taxes on repatriated foreign income. Several empirical studies provide striking evidence that US firms jumped at the chance and repatriated billions of dollars (Albring, Mills and Newberry, 2010; Blouin and Krull, 2009; Clemons and Kinney, 2008; Dharmapala, Foley and Forbes, 2011; Redmiles, 2008).

It is however very likely that multinationals all over the world expect some variation in repatriation taxes. More precisely, it is very likely that they will expect falling repatriation taxes. The extension of the EU parent-subsidiary directive, changes in national legislations,

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newly set up double tax treaties as well as treaty renegotiations show a clear overall trend of declining withholding taxes. I collected data on dividend taxation of a 58x57 country and 13 year matrix. Based on this data, there are 1,701 cases of declining withholding taxes. In 689 of these cases, it even shrunk to zero. By contrast, there are only 350 cases where the withholding tax increased, e.g. due to the expiration or cancellation of double tax treaties or changes in the national legislation. Figure 6-1 shows a striking negative trend in the average taxes withhold from cross-border intercompany dividends.

If the firm expects a cut in repatriation taxes in subsequent years and internal funds is the marginal source of finance, the expected change in repatriation taxes indeed affects investment decisions. The higher the repatriation tax rate, the higher is the probability and the benefit of a tax cut in the future. In this case, it becomes rational to defer distributions and reinvest profits until the expected tax cut will come into force. More precisely, the marginal cost of capital rises with the expected tax rate cut.

Figure 6-1: Average withholding tax on intercompany dividends

Average withholding tax rate on dividends in all combinations in a sample of 57 countries, in percent. The values denoted above are the annual means of the added up 57 country-specific average withholding-taxes.

Moreover, tax treaties are often negotiated for years and often become effective one or two years after they were being finalized and published.⁶⁶ Thus, multinationals can be expected to see the legal amendments in advance. This anticipation causes higher investment by the subsidiary right before the change. If repatriation taxes are significantly reduced or abolished, the incentive to retain profits and to invest in assets declines. Therefore, the growth path or even the stock of assets is expected to significantly decline just after a cut in repatriation taxes.

Consequently, high repatriation taxes can be associated with additional investment due to retention. If marginal returns are decreasing, local investment opportunities, for example in fixed assets, are however limited. At some day repatriation of free cash flow becomes rational. However, Weichenrieder (1996) points at investment in the capital market as another opportunity to reduce the excess burden repatriation taxes exerted on equity endowment. Investment in the capital market or in shares of other affiliated firms is independent from investment opportunities within the subsidiary. Consequently, the available interest rate in the

⁶⁶ For example, the revision of the treaty between Germany and Switzerland has been signed on March 12, 2002, has come into force at March 24, 2003 and is effective from January 1, 2004. For the treaty between Italy and Russia, the corresponding dates are April 9, 1996, November 30, 1998 and January 1, 1999. The treaty between the United States and Luxembourg was signed on April 3, 1996, came into force on December 20, 2000 and was effective January 1, 2001.

world capital market is the lower boundary for the investment of retained earnings. Moreover, Altshuler and Grubert (2003) note that, in particular, buying shares is a means to funnel funds to other affiliates but at the same time, to avoid repatriation taxes. Put it differently, investing in shares of affiliated firms is an alternative means to funnel equity to other investment opportunities of the multinational group without paying repatriation taxes. Therefore, excessive retention owed to high repatriation taxes are expected to affect financial investment, but not in additional (local) investment in fixed assets.

In a nutshell, the effects of repatriation taxes on financial assets and on real investments (cf. H-3) are expected to have opposing signs. If FDI data does not allow disentangling physical investment from financial investment, the positive effect of high repatriation taxes on financial assets might dominate the opposing effect on real capital. Based on these considerations, I set up the following hypothesis:

H6-4: Higher repatriation taxes positively affect financial investment in the capital market whereas repatriation taxes exert negative or even insignificant effects on real investments.

6.2.5 Repatriation Taxes and Financial Structures

In addition to the investment effects of repatriation taxes corresponding effects on capital structures has to be expected. Combining the arguments of the Old and New View on corporate taxation leads to the conclusion that a negative investment effect is expected if the source of finance is new equity. Sinn (1993) shows in a dynamic framework that repatriation taxes therefore initially lead to a nucleus of investment abroad. Then, however, the firm grows to maturity through retained earnings only. According to his model, the size of a mature subsidiary is unaffected by repatriation taxes. Nevertheless, the proportions of endowed equity capital (subscribed capital) and retained earnings (revenue reserves) are indeed affected by repatriation taxes because initial equity injection is negatively affected by repatriation taxes.

Moreover, the discussion in subsection 2.4 suggests additional retention if repatriation taxes are still high and are expected to decline someday. Then, the share of retained earnings but also the total share of equity capital should be positively affected by high repatriation taxes. Thus, I formulate the following hypothesis regarding the structure of equity finance:

H-5: *Repatriation taxes negatively affect the share of subscribed capital while they positively affect the share of revenue reserves in total capital.*

Hines (1994) uses a similar framework like Sinn (1993) but adds the possibility of debt financing. He also finds that the maturity size of the subsidiary is unaffected by repatriation taxes. Yet, the initially established nucleus is bigger. The affiliate just uses debt financing and subsequently, substitutes debt by retained profits during its growth to maturity. According to Hines' modeling, repatriation taxes positively affect the share of debt in an immature subsidiary because initial equity injections are negatively affected. Regarding a mature firm whose marginal source of finance is cutting distribution, repatriation taxes do not matter for the share of debt financing.

If, however, a firm expect falling repatriation taxes in the future, transitory retention is very reasonable. Corresponding to a positive effect of repatriation taxes on equity, an adverse effect on debt financing is expected. Thus, the expectation regarding debt financing is rather case sensitive. I set up the following hypothesis:

H6-6: *Repatriation taxes positively affect the share of debt financing if the subsidiary is still immature. Yet, repatriation taxes exert no significant effect on the debt share if the subsidiary's marginal source of finance is reducing distributions. If firms postpone repatriation, a negative effect of repatriation taxes is expected.*

6.3 Investigation Approach

In order to analyze how tax treaties and repatriation taxes affect investments and financial structures of multinational subsidiaries, I use firm-level data taken from the MiDi database. First, in accordance with previous literature dealing with effects of tax treaties, I take total investment stocks as the starting point of my analysis. Consequently, I consider total assets as my dependent variable. Then, I run simple regressions of the following type:

$$y_{i,t} = \beta_0 + a_1 y_{i,t-1} + X_{i,t} \beta_1 + \eta_i + \gamma_t + \varepsilon_{i,t} \quad (6-1)$$

The subsidiary is denoted by the subscript i and the respective year by t . I consider a time-specific effect γ_t . Moreover, I control for subsidiary-specific heterogeneity η_i . I remove the unobserved subsidiary-specific effect by estimating equation (6-1) in first differences (see Wooldridge, 2002). The vector X includes tax variables but also a set of firm-level information and host-country characteristics. Concerning tax variables, I basically consider

the host-country statutory tax rate. Moreover, I consider the aforementioned variables indicating either if a new tax treaty is enforced or has effectively changed the repatriation taxes on intercompany dividends. Furthermore, I consider measures of withholding and repatriation taxes.

The total asset stock is supposed to be rather persistent if adjustment is associated with significant costs (Chirinko, 1993). In additional regressions I take the persistence in the amount of total assets into account by including lags of total assets thereby capturing adjustment costs of investment levels. Since my time-series information is not sufficient to avoid what is called the Nickell bias (Nickell, 1981), I follow the idea by Anderson and Hsiao (1982) of an instrumental variable (IV) regression. I apply simple two-stage least squares (2SLS) estimations where the second lagged levels of the dependent variable $y_{i,t-2}$ is used as the additional instrumental variable excluded from the second stage regression.

Total assets include all types of investment. In order to test my hypotheses, I distinguish between different investment types in additional sets of regressions. Moreover, I also test my hypotheses on the impact of repatriation taxes on the financial structures.

6.4 Data

The empirical analysis uses firm-level data taken from the MiDi database for multinationals, which is provided by the German Central Bank (*Deutsche Bundesbank*). The comprehensive micro database covers information on both direct investment positions held in Germany by foreign companies and direct investment positions of German enterprises held abroad. In this study, I only analyze subsidiaries which are located outside Germany and are owned by a group having its headquarters in Germany.⁶⁷ Moreover, I exclude subsidiaries from the financial industry. The data allows me to trace groups and their affiliates as well as the detailed ownership chains over time from 1996 to 2008. The data collection is imposed by German law, which requires reporting for certain international transactions and positions.⁶⁸ This aspect of MiDi is worth emphasizing as I am thus able to observe virtually all major German outbound investments.

⁶⁷ I exclude observations from mining, agriculture, non-profit and membership organizations because special tax regimes may be available there. Furthermore, I exclude observations whose German parent is not an incorporated and legally independent entity, as well as subsidiaries which are not legally independent.

⁶⁸ Sec. 26 of the Foreign Trade and Payments Act (*Aussenwirtschaftsgesetz*) in connection with the Foreign Trade and Payments Regulation (*Aussenwirtschaftsverordnung*). Since 2002, FDI has to be reported if the participation is 10% or more and the balance-sheet total of the respective foreign investment in Germany exceeds EUR 3 million. For details see Lipponer (2008). Though previous years showed lower threshold levels, I apply this one uniformly for all years in the panel. For general interpretations of the dataset from a tax and finance perspective see Mintz and Weichenrieder (2010).

I consider a sample of subsidiaries located in 57 countries with Germany serving as the home country of the parent company. My sample consists of the fmy BRIC countries, 29 countries which were members of the OECD in 2008, and the eight EU member states which were not OECD countries in 2008.⁶⁹ In order to complete the picture of major investment flows, I additionally include tax havens and those larger economies showing substantial investment stocks of German multinationals.⁷⁰ I include the tax havens into my analysis despite their general lack of double tax treaties during the covered period. They play a noticeable role in FDI and can thus serve as a valid control group. While the headquarters of the multinational groups covered in my dataset are always located in Germany, I consider the investments in directly and indirectly held subsidiaries which are wholly-owned by a German firm. The total sample applied here consists of 85,030 observations of 18,266 subsidiaries. Most of these multinational subsidiaries from my dataset are located in the United States, representing 12% of the total observations. The US is followed by larger European economies with France and the UK representing about 9% and the Netherlands, Spain, Austria, Switzerland and Italy representing about 5% each. Still, my sample comprises several further observations from subsidiaries located in countries all over the world accounting for 45% of my sample. About two thirds of the subsidiaries are directly held. One third is held indirectly by a holding company abroad. Subsidiaries in countries like Russia, Korea or Poland are mainly held directly whereas subsidiaries in New Zealand, the United States or the United Kingdom are often held by at least one interposed holding. European and US subsidiaries are most often held by holding companies in the Netherlands or in Switzerland whereas Asian subsidiaries tend to be held via Singapore or Hong Kong.

In big economies, the majority of observable holding companies are domestic holdings. In this paper, however, I focus on cross border structures in order to analyze the influence of repatriation taxes and double tax treaties. Domestic holdings are not a problem for my estimation strategy for I keep the withholding tax constant at zero for the domestic case of a country holding. Given the size of my sample, I still have thousands of cross border connections which can be used for identification purposes.

⁶⁹ The BRIC countries are Brazil, Russia, India and China. The covered OECD countries are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom and the US. Moreover, I consider subsidiaries located in the EU countries Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Slovenia and Romania.

⁷⁰ Included tax havens are the Bermuda Islands, the Cayman Islands, the Dominican Republic, Hong Kong, Liechtenstein and Singapore. Moreover, I consider subsidiaries in Chile, Colombia, Croatia, Indonesia, Malaysia, Peru, Taiwan, Thailand, the United Arab Emirates and Uruguay.

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As my dependent variable, I particularly consider the investment level in total assets of each subsidiary. Moreover, in the further estimations I focus on different investment types and consider fixed assets, financial assets and current assets as dependent variables. Concerning the financial structures, I also run additional regressions using the share of either revenue reserves or subscribed capital or liabilities in total capital as dependent variables. Furthermore, I refer to the subsidiary-level profitability as a control variable.

As regards tax variables, I consider the statutory tax rate of the host-country corporate income tax. Concerning double tax treaty reforms, I consider two binary variables indicating whether an observation is from a year after a tax treaty reform is enforced. The dummy variable *Treaty Reform 1* turns to one if a new double tax treaty for the respective home and host country pair has been introduced or if there has been a reform of the existing treaty. The dummy variable is zero for years before a reform has taken place. The variable *Treaty Reform 2* indicates only tax treaty amendments which have effectively changed withholding taxes. Since companies cannot rely on a treaty before it is in force, I have used the latter point in time between the treaty's becoming effective and its enforcement as my year of change.⁷¹ Of course, I have also considered such amendments which change only particular aspects, such as the withholding tax, instead of the whole text of a treaty. Table 6-6 in the Appendix provides an overview of the tax treaty changes between 1996 and 2008 which have been used to set up the two binary variables.

My basic dataset covers the period from 1996 till 2008 and recognizes both directly and indirectly held subsidiaries. I only regard 100 percent participations. As indirectly held subsidiaries of German multinationals are included, I can monitor effects of changes in the withholding tax rates between each single pair of the 58 countries. I combine my firm-level data with detailed data on taxation of cross-border inter-company dividends. Altogether, my matrix of withholding tax relationships shows 58 x 57 combinations each for 13 years resulting in 42,978 cells. Concerning the methods of how incoming dividends are treated by the parent company or the holding location, I gathered information for the same number of combinations. I browsed all tax treaties of the relevant country pairs and considered when they came into force or were terminated. I also considered that the tax treaty information may be overridden by a more favorable national rule or by multilateral legislation like the parent-subsidiary directive. Please refer to Tables 6-7 and 6-8 in the Appendix for excerpts of these two matrices.

⁷¹ For example, a treaty becoming in force in 2007 with regulations effective retroactively to 2005 will still be considered as a change in 2007.

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From all the 42,978 conceivable withholding tax combinations, I see 1,701 cases (4.0%) where the withholding tax is lower as compared to the previous year and 350 cases (0.8%) where it is higher as compared to the previous year. The rare cases where the withholding tax is higher than in the past mainly stems from situations where there is no double tax treaty between two countries and then, the subsidiary country starts levying a withholding tax for the first time. Some country combinations do not appear at all in the sample used for the regressions, while others are frequently observable. The comprehensive information on bilateral withholding taxes and methods to avoid double taxation is used to construct two additional variables. First, I consider the nominal withholding tax effectively imposed on intercompany dividends (*Withholding Tax*). Second, the variable *Repatriation Tax* also takes into account the treatment of intercompany dividends in the home country of the receiving entity of the multinational firm.

As additional control variables I consider host country *GDP*, *GDP per Capita* and the *Inflation Rate* taken from the World Bank's World Development Indicators. Moreover, a variable *Country Risk* scaling from 0 to 7 with higher values corresponding to higher risk is derived from the OECD. Table 6-1 provides an overview of the definition, mean values and standard deviations of the variables employed in this study.

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Table 6-1: Descriptive statistics

Variable	Description	Mean	Standard Deviation
Total Assets	Total assets reported in the financial statements; measured in EUR '000.	222,728	2,844,082
Fixed Assets	Fixed and intangible assets reported in the financial statements; measured in EUR '000.	20,045	282,546
Financial Assets	Long-term financial assets reported in the financial statements; measured in EUR '000.	83,187	2,128,662
Shares of Affiliates	Financial assets in the form of shares of affiliated enterprises reported in the financial statements; measured in EUR '000.	25,569	564,777
Current Assets	Current assets reported in the financial statements; measured in EUR '000.	113,993	1,533,017
Nominal Capital	Subscribed or called-up capital, endowment capital and contributions by partners reported in the financial statements divided by total assets.	.300	.341
Liabilities	Liabilities reported in the financial statements divided by total assets.	.538	.290
Revenue Reserves	Revenue reserves plus profit/loss carried forward as reported in the financial statements divided by total assets.	.161	.336
Tax Rate	Statutory profit tax rate.	.317	.076
Treaty Reform 1	A tax treaty has been newly introduced or changed.	.185	.389
Treaty Reform 2	A tax treaty has effectively lowered withholding taxes.	.043	.204
Withholding Tax	Withholding tax on dividends for the respective country/country pair. It is the smaller of the domestic rate and the rate of an effective tax treaty.	.0158	.041
Repatriation Tax	The additional tax that needs to be paid effectively on repatriation. Differs from <i>Withholding Tax</i> due to recognition of the credit system and the company tax. (cf. the first page of the Appendix for further details)	.0305	.0478
Profitability	Profit or loss for the previous financial year as reported by the balance sheet divided by total assets.	.0632	.139
GDP	Gross Domestic Product measured in billion USD.	2.218	3.615
GDP per Capita	Gross Domestic Product per home country national; measured in current USD '000.	29.363	15.372
Inflation Rate	Inflation rate.	.0297	.038
Country Risk	OECD Country Risk Classification Method measures the country credit risk. Risk categories span from a low credit risk (0) to a high credit risk (7).	.556	1.212

Firm-specific variables are derived from the MiDi database of the German Central Bank. The tax variables are derived from information taken from the IBFD Tax Handbooks and the Worldwide Corporate Tax Guides by Ernst & Young. *GDP*, *GDP per Capita* and *Inflation Rate* stem from the World Development Indicators, edition 2009. *Country Risk* is based on information provided by the OECD.

6.5 Regression Results

6.5.1 Total Investment

In this section, I present my empirical results. First, I test my hypotheses regarding the effects of tax treaty reforms and repatriation taxes on total investment. The respective results are presented in Table 6-2. I start my analysis by considering simple binary variables which indicate that a new tax treaty is enforced. In columns (1) and (2) I consider if a new double tax treaty has been introduced or if there has been a reform of the formerly existing double tax treaty between 1997 and 2008 (*Treaty Reform 1*). In columns (3) and (4), I focus only on those treaty reforms that have effectively lowered withholding taxes on intercompany dividends (*Treaty Reform 2*).

In columns (2) and (4) – (7) of Table 6-2 I also control for the lagged dependent variable. As can be seen from the coefficient of the lagged dependent variable, the assets stocks are quite sticky over time, i.e. they are strongly influenced by the situation of the previous period. The respective results are from 2SLS. I use the second lag of the dependent variable as an instrumental variable for the lagged dependent variable. Concerning the performance of the instruments, I obtain *F*-statistics for the instruments used in the first-stage regression suggesting that instruments are strong and valid.

As can be seen from my results in Table 6-2, I hardly find significant effects exerted by the introduction or modification of a double tax treaty. In line with the existing literature, the effect on total assets is either insignificant or negative with a weak significance. In particular, once I control for the asset stock in a previous period, the effect of a treaty reform on total assets is insignificant. Therefore, the results on the binary variable do not confirm hypothesis H-1 of a general non-negative tax treaty effect on FDI. Furthermore, even the results presented in columns (3) and (4) do not confirm my hypothesis H6-2, which assumed a positive investment impact of tax treaties effectively lowering the withholding tax. My results are therefore in accordance with findings of the tax treaty literature.

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Table 6-2: Panel estimation on general effects of tax treaty changes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Assets	Total Assets	Total Assets	Total Assets	Total Assets	Total Assets	Total Assets
Dependent Variable $t-1$		.804*** (.041)		.803*** (.041)	.804*** (.041)	.803*** (.041)	.803*** (.041)
Treaty Reform ₁	-.009* (.006)	-.002 (.008)			-.001 (.008)	-.003 (.008)	
Treaty Reform ₂			-.008 (.013)	.002 (.017)			
Withholding Tax					.129 (.135)		
Repatriation Tax						-.050 (.102)	-.045 (.101)
Tax Rate	-.363*** (.060)	-.150* (.080)	-.360*** (.060)	-.149* (.080)	-.146* (.080)	-.152* (.080)	-.151* (.080)
Profitability	.061*** (.011)	-.005 (.020)	.061*** (.011)	-.005 (.020)	-.005 (.020)	-.005 (.020)	-.002 (.020)
(ln)GDP	.128* (.073)	.015 (.046)	.128* (.073)	.015 (.046)	.013 (.047)	.014 (.046)	.015 (.046)
(ln)GDP per Capita	.605*** (.082)	.199*** (.053)	.604*** (.082)	.199*** (.053)	.198*** (.053)	.200*** (.053)	.200*** (.053)
Inflation	-.040 (.047)	.046* (.026)	-.040 (.048)	.046* (.026)	.047* (.026)	.046* (.026)	.046* (.026)
Country Risk	-.010* (.006)	.010 (.007)	-.011* (.006)	.010 (.007)	.009 (.007)	.010 (.007)	.010 (.007)
Observations	85,030	85,030	85,030	85,030	85,030	85,030	85,030
<i>First Stage Results:</i>							
Instrument Coefficient		-.022*** (.001)		-.022*** (.001)	-.022*** (.001)	-.022*** (.001)	-.022*** (.001)
F-Test		441.70		441.56	440.36	439.83	439.61

The dependent variables are in logs. The standard errors shown in parentheses are robust and clustered on the subsidiary level. Year dummies for 1997-2008 are included but not reported. The results in columns (2) and (4) to (7) are from 2SLS. There, the instrument variable is the second lag of the dependent variable. *, ** and *** show significance at the level of 10%, 5% and 1 %.

Still, I suppose that repatriation taxes exert a significant impact on investments and their financing. Therefore, in columns (5), (6) and (7), I enrich my regressions by variables covering the aspect of withholding taxes on dividends. In specifications (6) and (7), I consider the variable *Repatriation Tax*. This variable stems from the withholding tax rates on dividends, but takes further aspects into consideration, such as if there is a credit or exemption method in the country of the parent company. I expect that the more refined consideration of the variation in the effective repatriation taxes may improve identification. Nevertheless, in columns (5) to (7), Table 6-2 shows that withholding taxes or repatriation taxes also yield

insignificant effects on total assets. Consequently, I am unable to find any significant effects of either tax treaty reforms or more detailed measures of repatriation taxes if total asset stocks are considered.

Concerning the control variables, the coefficients in Table 6-2 show the expected signs and effects. The general corporate income tax effect exerts a negative impact on total investment. A higher profitability is associated with more total investment. The variable *GDP* is often insignificant because I control for subsidiary specific effects, which also nest country effects.⁷² The positive impact of GDP per capita on assets can be explained by the tradeoff between labor intensive and capital intensive production since GDP per capita can be seen as a proxy for labor costs.

6.5.2 Real Investments

Taking into account the discussion in Section 2.4, opposing effects of repatriation taxes are expected if different investment types are considered. The insignificant effects of repatriation taxes on total assets might be a consequence of opposing responses to repatriation effects of different investment types. If these elements are differently affected, they might net out leading to a total effect which is insignificant. Therefore, I decompose the total tax response by separately considering different asset categories. In Table 6-3 I regress fixed assets on repatriation taxes and the variables indicating whether a tax treaty amendment took place.

In my hypothesis H6-3 I suppose a negative impact of repatriation taxes on FDI if new equity is the source of finance. The results shown in Table 6-3 suggest that fixed assets are negatively affected by repatriation taxes.⁷³ The size effects between the application of *Withholding Tax* and *Repatriation Tax* do not differ too much. In interpreting the results and in my further estimations I stick to *Repatriation Tax*, because, as described in Section 2, it is the more exact, sophisticated and relevant variable. The coefficient of -0.433 in column (5) of Table 6-3 indicates that a ten percentage point increase in the repatriation tax results in a stock of fixed assets which is 4.33 percent smaller.

⁷² As country fixed effects are therefore filtered out, the GDP cannot exert an influence as long as it fluctuates in line with the GDPs of other countries.

⁷³ Regarding the results presented in column (4) of Table 6-3 and in columns (1), (2), (4) and (6) of Table 6-4, I point out that the AR-2 test of autocorrelation is significant. This can be overcome by using an additional previous lag in the IV approach. Implementing this is reserved for a future version of this paper.

6. The Impact of Tax Treaties and Repatriation Taxes on FDI Revisited

Table 6-3: Effects of repatriation taxes on fixed assets

	(1)	(2)	(3)	(4)	(5)	(6)
	Fixed Assets	Fixed Assets	Fixed Assets	Fixed Assets	Fixed Assets	Fixed Assets
Dependent Variable t_{-1}	.600*** (.027)	.600*** (.027)	.600*** (.027)	.600*** (.027)	.600*** (.027)	.600*** (.027)
Treaty Reform ₁	-.008 (.022)		-.014 (.022)			-.014 (.022)
Treaty Reform ₂		-.018 (.051)				
Withholding Tax			-.486* (.274)	-.446* (.275)		
Repatriation Tax					-.433* (.264)	-.455* (.267)
Tax Rate	-.439** (.214)	-.436** (.214)	-.453** (.215)	-.447** (.215)	-.453* (.215)	-.459** (.215)
Profitability	.261*** (.053)	.261*** (.053)	.261*** (.053)	.210*** (.044)	.261*** (.053)	.261*** (.053)
(ln)GDP	.169** (.077)	.168** (.077)	.174** (.077)	.174** (.076)	.166** (.078)	.165** (.078)
(ln)GDP per Capita	.132 (.085)	.129 (.085)	.135 (.084)	.137* (.084)	.143* (.086)	.144* (.086)
Inflation	.232 (.173)	.232 (.173)	.231 (.173)	.231 (.173)	.230 (.173)	.230 (.173)
Country Risk	.007 (.017)	.007 (.017)	.010 (.017)	.010 (.017)	.010 (.017)	.010 (.017)
Observations	85,030	85,030	85,030	85,030	85,030	85,030
<i>First Stage Results:</i>						
Instrument Coefficient	-.047*** (.002)	-.047*** (.002)	-.047*** (.002)	-.047*** (.002)	-.047*** (.002)	-.047*** (.002)
F-Test	677.76	678.09	678.46	700.81	678.57	678.01

The dependent variables are in logs. The standard errors shown in parentheses are robust and clustered on the subsidiary level. Year dummies for 1997-2008 are included but not reported. All results are from 2SLS. The instrument variable is the second lag of the dependent variable. *, ** and *** show significance at the level of 10%, 5% and 1 %.

The significant effect supports my assumption that a closer look at repatriation taxes is advisable. While both domestic and multilateral regulations play a role concerning withholding taxes, they are still strongly driven by double tax treaties. Moreover, in column (6) I also consider the variable indicating if a tax treaty amendment took place. The effect of a tax treaty reform proves to be insignificant. This finding supports the view that the effective changes of repatriation taxes affect FDI whereas the various issues also concluded in a tax treaty do not really matter. At least, they do not exert a negative impact on FDI.

6.5.3 Financial Investments

I suppose that higher repatriation taxes cause firms to *increase* their financial asset stock if firms expect falling repatriation taxes in the future. Then, in the presence of high repatriation taxes, companies act rationally when they reinvest their profits instead of distributing them. Investing in financial assets grant access to investment opportunities not limited to the host country of the respective subsidiary. The results in columns (1) and (2) of Table 6-4 only weakly confirm a positive impact of repatriation taxes on financial assets.

Financial assets also include portfolio investments. Portfolio investments are however not very attractive if the firm has investment opportunities within the multinational firm. In columns (3) and (4) I therefore focus on shares of affiliated firms because investing in shares of other affiliated firms is an alternative means to funnel equity to investment opportunities of the multinational firm – without paying repatriation taxes. In fact, the results show a positive and highly significant effect of repatriation taxes on shares in affiliated firms. The coefficient of 0.873 in column (3) means that a one percentage point increase in the repatriation tax results in a 0.873 percent increase in the subsidiary's financial asset stock. Again, the material outcome does not depend on the inclusion of the tax treaty dummy.

As regards control variables, the effects are generally similar to those found for total assets and fixed assets. Interestingly, the host-country tax rate proves to be insignificant for investments in financial assets. This finding is very reasonable because when it comes to shares in affiliated firms, dividends are the most important income source. Most countries apply the exemption system or a foreign tax credit and therefore the relevance of host-country taxes is expected to be small.

Columns (5) and (6) of Table 6-4 show the effect of a treaty reform and of repatriation taxes on current assets. While the coefficient of the binary variable is negative and significant, the repatriation taxes themselves seem to exert no significant influence. In any case, these results are not robust. Since the dependent variable includes several sub-items like inventories, short-term financial assets and cash holding, the previously identified opposing effects may once again both play a role here. While inventories might respond in accordance with investment in fixed assets, short-term financial assets and cash holding might be adversely affected by repatriation taxes. Foley et al. (2007), for example, show that repatriation taxes can explain extensive cash holding by foreign subsidiaries of US multinationals. Unfortunately, my data does not allow demerging the current assets and identifying effects on its sub-items.

Table 6-4: Effects of repatriation taxes on financial assets and on current assets

	(1)	(2)	(3)	(4)	(5)	(6)
	Financial Assets	Financial Assets	Internal Financial Assets	Internal Financial Assets	Current Assets	Current Assets
Dependent Variable $t-1$	.595*** (.016)	.594*** (.026)	.579*** (.020)	.579*** (.020)	.486*** (.027)	.486*** (.027)
Treaty Reform ₁	.034 (.042)		-.040 (.038)		-.052** (.019)	
Repatriation Tax	.931* (.536)	.880* (.541)	.873** (.459)	.937** (.447)	-.099 (.054)	-.015 (.162)
Tax Rate	.536 (.441)	.521 (.445)	-.348 (.338)	-.331 (.338)	-.282* (.159)	-.260* (.158)
Profitability	.224*** (.073)	.223*** (.073)	.151** (.066)	.153** (.066)	-.158*** (.053)	-.159*** (.053)
(ln)GDP	-.298 (.336)	-.295 (.338)	-.323 (.332)	-.323 (.332)	.048 (.048)	.049 (.048)
(ln)GDP per Capita	.443 (.321)	.444 (.324)	.249 (.311)	.247 (.311)	.408*** (.063)	.405*** (.063)
Inflation	-.195*** (.067)	-.194*** (.067)	-.145* (.079)	-.146* (.079)	.145*** (.051)	.145*** (.051)
Country Risk	-.108*** (.017)	-.108*** (.036)	-.024 (.026)	-.024 (.026)	-.003 (.015)	-.003 (.014)
Observations	85,030	85,030	85,030	85,030	85,030	85,030
<i>First Stage Results:</i>						
Instrument Coefficient	-.093*** (.002)	-.092*** (.002)	-.076*** (.002)	-.075*** (.002)	-.136*** (.005)	-.136*** (.005)
F-Test	2,184.88	2,157.70	1,251.75	1,250.11	836.78	836.63

The dependent variables are in logs. The standard errors shown in parentheses are robust and clustered on the subsidiary level. Year dummies for 1997-2008 are included but not reported. All results are from 2SLS. The instrument variable is the second lag of the dependent variable. *, ** and *** show significance at the level of 10%, 5% and 1 %.

The coefficients of the control variables are as expected. The negative coefficients of profitability in columns (5) and (6) suggest a reduction of finished goods on stock when a company's products are strongly demanded and an incentive to reinvest profits into fixed assets instead of holding cash.

6.5.4 Capital Structures

In a final step I also analyze whether the structure of liabilities and shareholder's equity is affected by tax treaty reforms and, in particular, repatriation taxes. Since the impact of repatriation taxes on total capital, which corresponds to total assets, is insignificant, I decompose the effect into the effects on its elements nominal capital, revenue reserves and

liabilities. For each of these elements I run separate estimations. Table 6-5 shows the effect of repatriation taxes on the financial structures of multinational subsidiaries.

First, in columns (2) and (3) I focus on the effect of the repatriation taxes on the nominal capital of a subsidiary. My results suggest that a higher repatriation tax leads to a lower amount of subscribed or called-up capital. The coefficient of -0.088 in column (3) means that a ten percentage point higher repatriation tax leads to a 0.88 percent smaller share of new equity injection. This relationship corresponds to my finding of a negative effect of repatriation taxes on real investment in fixed assets. While the latter finding suggest that new equity is – at least to some extend - the marginal source of finance, new equity shrinks if repatriation taxes are high.

Columns (4) and (5) of Table 6-5 show that revenue reserves, by contrast, are positively affected by repatriation taxes on dividends. This result was also expected (cf. H-5) and corresponds well to my findings regarding investment in financial assets. If firms expect a decline of withholding taxes in the future, they act rationally when retaining profits and, in doing so, increasing their revenue reserves. The coefficient of 0.094 in column (5) can be interpreted as follows: A ten percentage point higher repatriation tax results in 0.94% higher revenue reserves.

Repatriation taxes have opposing effects on the different elements of equity. Higher repatriation taxes lead to a significantly higher share of revenue reserves and at the same time to significantly smaller new equity injections. The results are also in accordance with the equity nucleus proposition (Sinn, 1993). The opposing effects of repatriation taxes on new equity capital and revenue reserves confirm my hypothesis H6-5.

As can be seen in columns (6) and (7) of Table 6-5, the effect of repatriation taxes on liabilities is not significant. However, the discussion in Section 2.5 and H-6 do not lead to an unambiguous prediction on the effect of repatriation taxes on the share of debt financing.

Table 6-5: Effects of repatriation taxes on shareholder equity and liabilities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Capital	Nominal Capital	Nominal Capital	Revenue Reserves	Revenue Reserves	Liabilities	Liabilities
Dependent Variable _{t-1}	.803*** (.041)	.594*** (.039)	.594*** (.039)	.569*** (.037)	.569*** (.037)	.595*** (.018)	.595*** (.018)
Treaty Reform ₁			-.003 (.002)		-.001 (.003)		.005* (.003)
Repatriation Tax	-.045 (.101)	-.083** (.039)	-.088** (.039)	.096** (.043)	.094** (.045)	-.009 (.056)	-.002 (.056)
Tax Rate	-.151* (.080)	-.070* (.038)	-.071* (.039)	-.062* (.033)	-.062* (.033)	.136*** (.049)	.138*** (.049)
Profitability	-.002 (.020)	-.290*** (.015)	-.290*** (.015)	.429*** (.017)	.429*** (.017)	-.147*** (.008)	-.147*** (.008)
(ln)GDP	.015 (.046)	-.021 (.019)	-.021 (.019)	.000 (.029)	.000 (.029)	.021 (.028)	.022 (.027)
(ln)GDP per Capita	.200*** (.053)	.008 (.019)	.008 (.019)	.027 (.029)	.027 (.029)	-.033 (.028)	-.033 (.027)
Inflation	.046* (.026)	.020** (.008)	.020** (.008)	.028*** (.010)	.028*** (.010)	-.050*** (.007)	-.050*** (.007)
Country Risk	.010 (.007)	-.001 (.003)	-.001 (.003)	.001 (.004)	.001 (.004)	.001 (.003)	.001 (.004)
Observations	85,030	85,030	85,030	85,030	85,030	85,030	85,030
<i>First Stage Results:</i>							
Instrument Coefficient	-.022*** (.001)	-.096*** (.003)	-.096*** (.003)	-.096*** (.003)	-.096*** (.003)	-.121*** (.002)	-.121*** (.002)
F-Test	439.61	499.48	500.29	685.45	684.49	2,962.94	2,986.48

The dependent variables are in logs. The standard errors shown in parentheses are robust and clustered on the subsidiary level. Year dummies for 1997-2008 are included but not reported. All results are from 2SLS. The instrument variable is the second lag of the dependent variable. *, ** and *** show significance at the level of 10%, 5% and 1 %.

As to control variables, let us only briefly discuss some selected effects. The host-country tax rate negatively affects both nominal capital and revenue reserves while the impact on debt is positive. These relationships confirm previous findings on taxes and capital structure choices (Desai, Foley and Hines, 2004; Huizinga and Laeven, 2008). The positive impact of profitability on revenue reserves does not come as a surprise. Then, the negative impact of profitability on the other financial shares can be explained by the simple fact that they represent the remaining parts of total capital. As the revenue reserves increase, the relative share of nominal capital and liabilities automatically decline even though their absolute values might remain constant.

6.6 Concluding Remarks

I have analyzed how tax treaties and repatriation taxes affect investment and capital structures of multinational subsidiaries. If I follow the approach taken by previous studies and consider simple binary variables indicating the enforcement of a new tax treaty, I find insignificant effects on total asset stocks. Then, I have particularly tested whether changes of repatriation taxes affect total investment of multinational subsidiaries. Yet, I am also unable to find any statistically significant effects of repatriation taxes on total investment.

In additional analyses, however, I have taken into account that different types of investment might be adversely affected by changes of repatriation taxes. Indeed, my results suggest that fixed assets are negatively affected by higher repatriation taxes while, at the same time, passive investment in financial assets declines. My findings are in accordance with expectations on the effect of repatriation taxes. Investment in fixed assets is negatively affected by repatriation taxes leading to the conclusion that new equity is the marginal source of finance. Moreover, my results suggest that firms postpone repatriation because they have the general expectation that - due to new tax treaties - high repatriation taxes will decrease in the future. In a lack of local investment opportunities, the respective funds are then invested in the capital market and in particular in shares of affiliated firms. Accordingly, I find a positive effect of repatriation taxes on financial investments.

The behavioral response to repatriation taxes is also confirmed by corresponding effects of repatriation taxes on financial structures of the subsidiaries. My results suggest significant effects on the structure of equity finance. Higher repatriation taxes are associated with a significantly higher share of revenue reserves and at the same time with significantly smaller new equity injections.

The results suggest that the aspect of repatriation taxes on dividends is worth analyzing. They seem to exert a significant impact on specific kinds of investments. The opposing effects, e.g., on investment in fixed and financial assets lead to an overall insignificant effect on total investment. These opposing effects might explain previous findings of an insignificant effect of tax treaties on aggregated FDI. My results suggest that changes of the repatriation taxes exert statistically significant effects on both investment and the structure of equity financing. Therefore, tax treaties seem to be strongly considered by multinational companies if the treaty effectively affects repatriation taxes. By contrast, the general observation if a tax treaty exists or was rephrased does not exert a significant effect on investment.

6.7 Appendix

Methods to Avoid Double Taxation and Repatriation Taxes

If the exemption method is applied, repatriated intercompany dividends are tax exempt at the level of the firm receiving the dividends. Yet, in a few countries like France, Germany or Belgium a share α is still subject to tax, whereas in most countries applying the exemption method, $\alpha = 0$. Then, the tax m imposed on one dollar of intercompany dividends amounts to:

$$(6-2) \quad m = \alpha \tau^R + \omega^S$$

Where τ^R is the corporate tax rate of the residence country and ω^S is the withholding tax rate imposed on intercompany dividends by the source country.

In the case of a credit system, intercompany dividends are subject to tax but taxes paid abroad reduce the tax liability. If a direct credit is applied, the foreign tax credit includes the withholding taxes imposed on intercompany dividends. Then, the additional tax imposed on one dollar of intercompany dividend amounts to:

$$(6-3) \quad m = \tau^R - \min\{\tau^R; \omega^S\} + \omega^S$$

An indirect credit also includes foreign corporate taxes τ^S paid by the subsidiary. The additional tax imposed on intercompany dividends is computed in accordance with the following expression:

$$(6-4) \quad m = \frac{\tau^R}{(1-\tau^S)} - \min\left\{\frac{\tau^R}{(1-\tau^S)}; \frac{\tau^S}{(1-\tau^S)} + \omega^S\right\} + \omega^S$$

Expressions (6-3) and (6-4) show that the repatriation tax is determined by the tax rate of the residence country. It can be deducted from the formulas that there is a conceivable situation where a decrease in the withholding tax ω^S is just subsidized by a proportional increase in τ^R . This is the case if the tax rate of the residence country exceeds the tax credit. Then, a reduction of withholding tax, e.g., caused by a new tax treaty, has no material effect.

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Table 6-6: Selected tax treaty changes between 1996 and 2008

Parent	Subsidiary	1st Tax Treaty	Treaty Revision	WHT before	WHT after	Parent	Subsidiary	1st Tax Treaty	Treaty Revision	WHT before	WHT after
Australia	Austria		2002	.15	.15	Brazil	Portugal	2002		.25	.1
Australia	Canada	1998		.2	.1	Bulgaria	Canada	2002		.1	.1
Australia	Czech Republic	2001		.1	.1	Bulgaria	Croatia	1999		.15	.05
Australia	Finland		2002	0	0	Bulgaria	Cyprus	2000		.25	.1
Australia	Malaysia		2006	0	0	Bulgaria	Czech Republic		2000	.15	.1
Australia	Mexico	2008		0	0	Bulgaria	Greece	2006		0	0
Australia	Norway		1997	.25	.05	Bulgaria	Ireland		2002	0	0
Australia	Romania		2007	.15	0	Bulgaria	Latvia	2007		0	0
Australia	Russia	1998		0	0	Bulgaria	Lithuania	2000		.2	.05
Australia	Slovak Republic	2001		.05	0	Bulgaria	Portugal	2001		0	0
Australia	Taiwan	2001		.25	.1	Bulgaria	Singapore		2003	.05	.05
Australia	United Kingdom		1998	0	0	Bulgaria	Slovak Republic	2002		.2	.1
Australia	United States		1997	.05	.05	Bulgaria	Slovenia		2008	0	0
Austria	Australia		2002	.15	.15	Bulgaria	Thailand		2008	.15	.1
Austria	Canada		2003	.15	.15	Bulgaria	Turkey	2001		.2	.1
Austria	Croatia	2002		.25	0	Canada	Australia		2003	.15	.05
Austria	Czech Republic		2008	0	0	Canada	Belgium		2008	0	0
Austria	Estonia		2004	.25	0	Canada	Bulgaria		2000	.15	.1
Austria	Finland		1998	0	0	Canada	Chile	2003		0	0
Austria	Germany		1997	.15	.1	Canada	Croatia	2000		.25	.05
Austria	India		2001	.25	.1	Canada	Czech Republic		2003	.1	.05
Austria	Korea		1996	.07	.05	Canada	Denmark	2005		.35	.05
Austria	Latvia	1996		.2	.05	Canada	Finland		1999	0	0
Austria	Lithuania	2006		0	0	Canada	France	2001		0	0
Austria	Mexico	2004		.3	0	Canada	Germany	1998		.1	.05
Austria	Netherlands		2003	0	0	Canada	Hungary	2005		0	0
Austria	New Zealand		1997	.15	.15	Canada	Iceland	2002		.25	.05
Austria	Norway		2003	.15	.05	Canada	India		1999	.15	.1
Austria	Poland	2004		.35	.05	Canada	Indonesia		1997	.1	.1
Austria	Romania		1999	.1	.05	Canada	Ireland	1996		0	0
Austria	Russia	2000		0	0	Canada	Japan		2007	0	0
Austria	Singapore	2001		0	0	Canada	Korea		2003	.15	.05
Austria	Slovenia	2007		0	0	Canada	Latvia	2001		0	0
Austria	Sweden		1998	0	0	Canada	Lithuania	1999		0	0
Austria	Switzerland		2006	0	0	Canada	Luxembourg	2005		0	0
Austria	United Arab Emirates	1996		.25	0	Canada	Mexico	2007		0	0
Austria	United States		2000	0	0	Canada	Netherlands	2002		.15	0
Belgium	Brazil		2008	.15	.1	Canada	Norway		2006	.05	0
Belgium	Canada		2005	.15	.05	Canada	Peru		2006	0	0
Belgium	China	2005		0	0	Canada	Portugal		1998	.25	.1
Belgium	Croatia	2005		.1	.05	Canada	Romania	1997		0	0
Belgium	Cyprus	2001		.17	.1	Canada	Russia		1998	.25	.15
Belgium	Czech Republic		2001	.15	.05	Canada	Slovak Republic	2000		0	0
Belgium	Denmark		1999	.15	.05	Canada	Slovenia	2007		0	0
Belgium	Estonia		1996	.25	.05	Canada	Spain	2003		0	0
Belgium	Germany		2003	.1	.05	Canada	Sweden		2006	0	0
Belgium	Greece	1999		.25	.05	Canada	Switzerland		1998	0	0
Belgium	Hong Kong		2005	0	0	Canada	United Arab Emirates	2008		0	0
Belgium	Iceland	2000		0	0	Canada	United Kingdom		1998	0	0
Belgium	Indonesia	1997		0	0	Chile	Brazil		2004	.35	.1
Belgium	Latvia	1999		0	0	Chile	Canada	2000		.35	.1
Belgium	Lithuania	2005		0	0	Chile	Croatia	2005		.35	.05
Belgium	Luxembourg	2007		0	0	Chile	Denmark		1996	0	0
Belgium	Mexico	2006		.25	.05	Chile	France		2002	0	0
Belgium	Netherlands		1998	.05	.05	Chile	Ireland		2007	0	0
Belgium	Poland	1997		0	0	Chile	Korea		2007	.15	.05
Belgium	Portugal	1997		.15	.1	Chile	Malaysia		2004	0	0
Belgium	Romania	2005		.15	.05	Chile	Mexico		2008	.1	.05
Belgium	Russia		1997	.25	.1	Chile	New Zealand		1996	0	0
Belgium	Singapore	2008		0	0	Chile	Norway		2002	0	0
Belgium	Slovak Republic	2004		.15	.05	Chile	Peru		2004	.1	.05
Belgium	Slovenia	2005		0	0	Chile	Singapore		2007	.1	.05
Belgium	Spain		1997	0	0	Chile	Sweden		1997	0	0
Belgium	Taiwan	1998		.3	.15	Chile	United Kingdom		1999	0	0
Belgium	United States	2000		0	0						
Brazil	Belgium		1997	.05	.05						
Brazil	Chile		2004	0	0						
Brazil	Finland		2007	.1	.05						
Brazil	Germany		2006	.15	.211						
Brazil	Mexico	1998		.25	.05						
Brazil	Norway	2004		.35	.05						

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Table 6-7: Withholding tax rates on dividends in 2008

[illegible]

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

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Table 6-8: Methods of dealing with incoming dividends in 2008

[illegible]

The abbreviations used in the table are the following: EX = exemption, 5 = exemption by 95%, IC = indirect credit, DC = direct credit, DE = deduction, DO = double taxation. The methods refer to a dividend flowing from a company located in the country of the column to the left ("=Source Country") to its owner company located in the country of the individual columns of the table. For example, France exempts a dividend from a Japanese company by 95% whereas Japan uses the indirect credit method for dividends flowing in from French companies.

6.8 References

- Albring, S., L.F. Mills and K.J. Newberry (2010): Do Debt Constraints Influence Firms' Sensitivity to a Temporary Tax Holiday on Repatriations? Syracuse University.
- Altshuler, R. and H. Grubert (2003): Repatriation taxes, repatriation strategies and multinational financial policy, *Journal of Public Economics* 87, 73-107.
- Anderson, T. and C. Hsiao (1982): Formulation and Estimation of Dynamic Models Using Panel Data, *Journal of Econometrics* 18, 47-82.
- Auerbach, A.J. (1979): Wealth Maximization and the Cost of Capital, *Quarterly Journal of Economics* 94, 433-436.
- Auerbach, A.J. (1983): Taxation, Corporate Financial Policy and the Cost of Capital, *Journal of Economic Literature* 21, 905-940.
- Bellak, C. and M. Leibrecht (2010): Does Lowering Dividend Tax Rates Increase Dividends Repatriated? Evidence of Intrafirm Cross-Border Dividend Repatriation Policies by German Multinational Enterprises, *FinanzArchiv* 66, 350-383.
- Blouin, J. and L. Krull (2009): Bringing It Home: A Study of the Incentives Surrounding the Repatriation of Foreign Earnings under the American Jobs Creation Act of 2004, *Journal of Accounting Research*, 47, 1027-1059.
- Blonigen, B.A. and R.B. Davies (2004): The effects of bilateral tax treaties on U.S. FDI activity, *International Tax and Public Finance* 11, 601-622.
- Chirinko, R.S. (1993): Business fixed investment spending: modelling strategies, empirical results, and policy implications, *Journal of Economic Literature* 31, 1875-1911.
- Clemons, R. and M. Kinney (2008): An Analysis of the Tax Holiday for Repatriation Under the Jobs Act, *Tax Notes*, 120, 759-768.
- Davies, R.B., P.J. Norbaeck and A. Tekin-Koru (2009): The effect of tax treaties on multinational firms: new evidence from microdata, *World Economy*, 77-110.
- Davies, R.B. (2003): Tax Treaties, Renegotiations, and Foreign Direct Investment, *Economic Analysis and Policy* 33, 251-273.
- De Mooij, R.A. and S. Ederveen (2003): Taxation and foreign direct investment: a synthesis of empirical research, *International Tax and Public Finance* 10, 673-693.
- Desai, M.A., C.F. Foley and J.R. Hines (2004): A Multinational Perspective on Capital Structure Choice and Internal Capital Markets, *Journal of Finance*, 59, 2451-2487.
- Desai, M.A., C.F. Foley and J.R. Hines (2007): Dividend policy inside the multinational firm, *Financial Management* 36, 5-26.
- Dharmapala, D., F. Foley and K.J. Forbes (2011): Watch What I Do, Not What I Say: The Unintended Consequences of the Homeland Investment Act, *Journal of Finance*, 66, 753-787.
- Dickescheid, T. (2004): Exemption vs. credit method in international double taxation treaties, *International Tax and Public Finance* 11, 721-739.

- Di Giovanni, J. (2005): What Drives Capital Flows? The Case of Cross-Border M&A Activity and Financial Deepening, *Journal of International Economics* 65, 127-149.
- Egger, P., M. Larch, M. Pfaffermayr and H. Winner (2006): The impact of endogenous tax treaties on foreign direct investment: theory and empirical evidence, *Canadian Journal of Economics* 39, 901-931.
- Egger, P., S. Loretz, M. Pfaffermayr and H. Winner (2009): Corporate Taxation and Multinational Activity, Oxford University Centre for Business Taxation Working Paper 09/04.
- Feld, L. and J.H. Heckemeyer (2011): FDI and Taxation – A Meta Study, *Journal of Economic Surveys*, 25, 233-272.
- Foley, C., J. Hartzell, S. Titman and G. Twite (2007): Why do Firms Hold so Much Cash? A Tax-Based Explanation, *Journal of Financial Economics*, 86, 579-607.
- Harberger, A. (1962): The Incidence of the Corporation Income Tax, *Journal of Political Economy* 70, 215-240.
- Hartman, D. (1985): Tax Policy and Foreign Direct Investment, *Journal of Public Economics* 26, 107-121.
- Hines, J.R. (1994): Credit and Deferral as International Investment Incentive, *Journal of Public Economics* 55, 323-347.
- Hines, J.R. (1996): Altered States: Taxes and the Location of Foreign Direct Investment in America, *American Economic Review*, 86, 1076-1094.
- Huizinga, H. and L. Laeven (2008), International Profit Shifting within Multinationals: A Multi-Country Perspective, *Journal of Public Economics* 92, 1164-1182.
- Huizinga, H. and J. Voget (2009): International Taxation and the Direction and Volume of Cross-Border M&As, *Journal of Finance* 64, 1217-1249.
- Janeba, E. (1995): Corporate income tax competition, double taxation treaties, and foreign direct investment, *Journal of Public Economics* 56, 311-325.
- King, M.A. (1974a): Taxation and the cost of capital, *Review of Economic Studies* 41, 21-35.
- King, M.A. (1974b): Dividend Behaviour and the Theory of the Firm, *Economica* 41, 25-34.
- Lipponer, A. (2008): *Microdatabase direct investment – a brief guide*, Frankfurt.
- Louie, H.J. and D.J. Rousslang (2008): Host-country governance, tax treaties and US direct investment abroad, *International Tax and Public Finance* 15, 256-273.
- Millimet, D. and A. Kumas (2007): *Reassessing the effects of bilateral tax treaties on US FDI activity*, Working Paper, Dallas.
- Mintz, J. and A. Weichenrieder (2010): *The indirect side of direct investment – multinational company finance and taxation*, Cambridge, MA.
- Mintz, J. and H. Tulkens (1996): Optimality properties of alternative systems of taxation of foreign capital income, *Journal of Public Economics* 60, 373-401.

- Neumayer, E. (2007): Do double taxation treaties increase foreign direct investment to developing countries?, *Journal of Development Studies* 43, 1501 — 1519.
- Neumayer, E. and L. Spess (2005): Do bilateral investment treaties increase foreign direct investment to developing countries?, *World Development* 33, 1567-1585.
- Nickell, S.J. (1981): Biases in dynamic models with fixed effects, *Econometrica* 49, 1417-1426.
- Organization for Economic Cooperation and Development (OECD) (2010): Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, Paris.
- Overesch, M. and G. Wamser (2009): Who Cares About Corporate Taxation? Asymmetric Tax Effects on Outbound FDI, *World Economy* 32, 1657-1684.
- Redmiles, M. (2008): The One-Time Received Dividend Deduction, *Statistics of Income Bulletin*, 102-114.
- Salacuse, J.W. and N.P. Sullivan (2005): Do BITs really work: an evaluation of bilateral investment treaties and their grand bargain, *Harvard International Law Journal* 46, 67-130.
- Sinn, H.W. (1984): Die Bedeutung des Accelerated Cost Recovery System fuer den internationalen Kapitalverkehr, *Kyklos* 37, 542-576.
- Sinn, H.W. (1993): Taxation and the Birth of Foreign Subsidiaries, in: H. Heberg and N. Van Long (Eds), *Trade, Welfare, and Economic Policies - Essays in Honor of Murray C. Kemp*, University of Michigan Press, 325-352.
- Weichenrieder, A. (1996): Anti-Tax Avoidance Provisions and the Size of Foreign Direct Investment, *International Tax and Public Finance* 3, 67-81.
- Wooldridge, J.M. (2002): *Econometric analysis of cross section and panel data*, Cambridge, Massachusetts, The MIT Press.

6.9 Survey 4: Empirical studies on the effect of withholding taxes and related aspects

Survey ⁷⁴	Data	Methodology	Results
Altshuler, Grubert (2003)	Firm level data of about 7,500 U.S.-controlled foreign companies provided by the IRS. The 1996 corporate tax files compiled by the Statistics of Income (SOI) Division of the Internal Revenue Service cover balance sheet information as well as profit and loss account information.	OLS estimations of the effects of different kinds of taxes (statutory corporate income tax, withholding tax) on financial assets with different maturities. Additional OLS regressions concerning the tax effect on CFC debt.	The investment into internal financial assets comes as a third option for a subsidiary besides repatriating direct dividends to the parent or investing in its own real operations. Controlled foreign corporations facing high repatriation taxes make greater investments in related affiliates and send a greater share of their dividends to other foreign affiliates.
Auerbach, Hasset (2003)	Unbalanced firm-level panel data set derived from the Compustat industrial, full-coverage, and research files, for the eighteen-year period 1981-1998	Tobit estimations with the dividend/assets ratio serving as the dependent variable. The independent variables are investment, value, cash and debt. Additional bivariate Tobit regressions with new shares/repurchases as the dependent variable and the previously described independent variables.	Strong support for the hypothesis that dividends do respond to investment as well as to cash flow (new view). Furthermore, new share issues are quite responsive to investment and equally responsive to increases in cash flow. This contradicts one of the key elements of the traditional view, namely that dividend taxes raise the cost of capital.
Bellak, Leibrecht (2010)	Outbound set of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The years 1999 till 2005 are used.	Application of the Lintner Model. The dependent variable is the dividend payments to the German mother. The crucial independent variable is the dividend tax on repatriation per country.	The regression yields semi-elasticities of about -3.5 (evaluated at the overall mean) and -1.6 (evaluated at the mean of positive dividends), respectively, implying that a one percentage point change in the dividend tax rate will change dividends repatriated by 3.5 (1.6) percent.
Blonigen, Davies (2004)	FDI activity data reported by the Bureau of Economic Analysis (BEA); outbound FDI flows since 1966, inbound FDI flows over the period 1980-1999.	The FDI stock serves as the dependent variable. The crucial binary independent variable differentiates between an old and a new tax treaty.	No systematic evidence can be found that bilateral tax treaties affect FDI activity. Instead, the results suggest either that the provisions of a treaty have no effect or that the positive and negative aspects of treaty formation largely cancel out one another.

⁷⁴ Some of the methodologies' and results' summaries quote the respective papers literally.

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Chisik, Davies (2004a)	Two 1992 data sets. One containing US and its bilateral tax treaty partners, with two subsamples (affiliate sales and FDI stock). The second data set uses the FDI stock between OECD member countries.	OLS, Instrumental variables, Tobit, gravity and probit estimations. The dependent variable is a measure of FDI activity from a parent country to a host country. The crucial independent variables are the stock of home FDI, the stock of foreign FDI, the home non-treaty tax, foreign non-treaty taxes, and the home share of GDP.	The paper models the bargaining process behind bilateral tax treaty development and yields three main outcomes: There are conflicting interests in treaty formation. The terms of tax treaties vary systematically across countries. Asymmetries in FDI levels affect the threat point in the bargaining problem. As asymmetries increase, the scope of possible cooperative outcomes diminishes.
Chisik, Davies (2004b)	Withholding tax rates on dividends and interest for the US non-treaty case, for 7 bilateral cases including the US, and for 3 country combinations where the US is not involved.	Model with two-way irreversible FDI flows. Analytical focus with data serving as supporting evidence.	Bilateral tax treaties may increase FDI and improve the global allocation of capital relative to non-treaty outcomes. FDI will be largest between rather similar countries.
Clark (2000)	Analysis of several recent empirical papers on the tax effect on FDI, but no meta regressions.	Meta study on sensitivity of FDI to CIT rates.	Sensitivity of both real and financial businesses towards CIT rate increases over time. A lot of tax planning is focusing on statutory corporate tax rate differences between countries. Empirical results suggest that bilateral WHT reductions can increase FDI activity.
Davies (2003a)	FDI activity data reported by the Bureau of Economic Analysis; outbound FDI flows since 1966, inbound FDI flows since 1980.	CMM model as modified by Blonigen, Davies, Head Dependent variable: FDI; the most important (binary) independent variable is whether there has been a revision of a bilateral tax treaty (1) or not (0).	There is no empirical evidence that renegotiations of treaties have a positive effect on FDI.
Davies (2004)	Review of seminal empirical tax treaty literature, but no quantitative analysis of the respective outcomes.	Mainly qualitative description of the differences between theoretical and empirical effects of bilateral tax treaties.	The main finding is that theoretical and empirical papers study different topics. Theorists see treaties as a way to coordinate tax policies across countries and thus to increase FDI. Empirical papers, however, focus on the effects of tax treaties already in place and their impact on FDI.

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Davies, Norbäck, Tekin-Koru (2009)	Firm-level data on Swedish firms for the years 1965-1998.	First, there are probit estimates of treaty effects on having an affiliate in the host country; Dependent variable: Entry versus no entry; Independent variable: Treaty (yes or no). Second, there are OLS estimates of treaty effects on the level of sales, exports and imports of Swedish affiliates: Dependent variables: Sales, Exports, Imports; Independent binary Variable: treaty yes/no.	Tax treaties have little effect on the level of FDI activity. However, a tax treaty increases the probability of having an affiliate in a given country. Furthermore, an impact of treaties on MNE's marginal trade decisions is identified, meaning that a treaty leads to lower reported profits of the firm in the host country. This should be achieved by manipulating intra-firm trade.
Desai, Foley, Hines (2006)	BEA panel data set for the years 1982-2002. Covers U.S.-based foreign operations.	OLS and Tobit Regressions; Dependent variable: Dividend payments by affiliates; Independent variables: Net income, lagged dividend payments.	Foreign affiliates of U.S. companies follow well-defined repatriation patterns. Though taxes do have an impact, they cannot alone explain these patterns as those patterns are similar across entities with distinctive tax treatments. For instance, highly-leveraged parent companies are associated with higher dividends from their affiliates. Additionally, higher dividend payments to the parent company's shareholders also result in higher dividends being received from its affiliates. Last but not least, split-ownership contributes to stable dividend policies.
Di Giovanni (2005)	Thomson Financial Securities Data panel data set on M&A activity for the years 1990 till 1999.	Tobit; dependent variable: gross M&A investment flows; Independent variables: stock market capitalization, credit provided to the public sector, customs union, service agreement, free-trade agreement, average corporate tax rate, Capital Tax Treaty	A 1% increase of the stock market to GDP ratio is associated with a 0.955% increase in cross-border M&A activity. Firms invest more money in countries they trade with. A common language also encourages M&A activity. Furthermore, custom unions and free trade agreements negatively influence cross-border M&A activity, whereas service agreements have a positive effect. Last but not least, high taxes in the target country decrease acquisitions, while capital tax treaties increase M&A activity.

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Egger, Merlo, Ruf, Wamser (2012)	Amadeus ownership micro data set of the year 2008, covering information on 61,737 foreign owners located in 29 different European countries.	The paper uses the UK's switch in dividend treatment as of 2009 for identification. As of 2009, the UK switched from the worldwide taxation system to the exemption system with regards to dividends. The reform's impact on the repatriation pattern and other outcomes of UK-owned affiliates is estimated.	The results imply that, due to the switch from the worldwide tax system to tax exemption, foreign affiliates of UK owners responded to the reform by repatriating more foreign dividends than without the reform. Furthermore, other economic measures besides dividend repatriation also seem to be affected by the reform: affiliate-level investment was negatively affected and the affiliate level sales-to-fixed-assets ratio was positively affected.
Egger, Larch, Pfaffermayr, Winner (2006)	OECD panel dataset of outward FDI for the years 1985-2000.	Difference-in-differences propensity score-matching approach based on a numerically solvable general equilibrium model. The dependent variable is the respective change in bilateral stocks of outward FDI. The central independent variable is the existence of a new double tax treaty in the respective bilateral relationship.	Newly implemented double taxation treaties have a significant negative impact on the bilateral stocks of outward foreign direct investment.
Egger, Larch, Pfaffermayr, Winner (2009)	2361 observations of bilateral foreign direct investment (FDI) outbound stocks among OECD countries between 1991 and 2002.	Computed effective tax rates are used to trace the tax impact on FDI. The results are supposed to be less biased as to the application of unilateral tax rates. These bilateral effective tax rates serve as a basis to estimate the impact of corporate taxation on outbound stocks of bilateral foreign direct investment (FDI) among OECD countries between 1991 and 2002.	Based on the regression results, outbound FDI seem to be positively related to the parent and host country tax burden and negatively associated with bilateral effective tax rates.
Egger, Loretz, Pfaffermayr, Winner (2004)	Panel data set of bilateral outward FDI, 1991-2004, from UNCTAD's Major FDI Indicators (2007)	Dependent variable: log stocks of bilateral FDI; Independent variables: Corporate Tax Rates (Host & Parent country), Depreciation Allowance (Host & Parent country), and host country WHT.	The analysis focuses on three instruments of tax law; statutory corporate tax rates, the deductibility of fixed costs from the tax base, and withholding tax rates on dividends in order to examine their impact on FDI. Different combinations of the tax instruments may lead to an

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			identical level or change of the effective tax rate for the average MNE. However, the resulting impact on FDI or other modes of MNE activity may differ due to heterogeneous indirect effects on other firms.
Egger, Merlo (2011)	MiDi panel data set for 1996-2005.	Two-step approach, first binary (is there an affiliate yes or no) and then in a second step estimation with the Poisson QMLE method.	Higher statutory tax rates in a country reduce the probability of a German MNE setting up an affiliate in this country and also reduce the number of affiliates, number of employees as well as the value of FDI stocks and foreign assets in that country. Double Taxation Treaties have a positive impact on the first investment and also on FDI and foreign assets. However, their impact is much smaller than that of statutory tax rates.
Foley, Hartzell, Titman, Twite (2007)	Compustat 1982-2004; Bureau of Economic Analysis survey on U.S. direct investment abroad	Dependent variable: natural logarithm of the ratio of cash to net assets; Independent variable: effective repatriation tax rate (net PPE or employment weighted)	U.S. companies whose repatriation of profits would trigger high taxes have higher consolidated cash holdings abroad than those whose repatriation taxes are low. A one standard deviation increase in the tax burden from repatriating foreign income is associated with a 7.9% increase in the ratio of cash to net assets. Secondly, affiliates in low tax countries hold more cash than affiliates of the same parent in high-tax countries. Thirdly, firms which are less financially constrained domestically and which are more technology intensive, exhibit a higher sensitivity of affiliate cash holdings to repatriation tax burdens.
Grubert, Altshuler (2000)	1996 corporate tax files compiled by the Statistics of Income; 6,000 CFCs, approximately 4,000 of which are non-financial.	(a) Dependent variable: specific asset items / total CFC assets; Independent Variables: asset age, withholding tax, corporate income tax, tax haven status, log of GDP, log of GDP per capita. (b) Dependent variable: dividends paid to foreign affiliates/total dividends; independent variables: see (a)	The availability of alternative repatriation strategies can affect real investment in the low-tax subsidiary and throughout the worldwide corporation. Controlled foreign corporations that face high repatriation taxes invest more in related affiliates and send a bigger share of their dividends to other foreign affiliates. In addition, they also pay off more local debt as they accumulate retained earnings.

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Huizinga, Laeven, Nicodème (2007)	Amadeus firm-level dataset for European multinationals and their subsidiaries for the years 1994-2003.	Dependent variable: financial leverage (total liabilities to total assets); Independent variables: effective marginal tax rate, tax incentive to shift debt	The leverage of a firm depends on national tax rates as well as the international tax rate differences and therefore hints at international debt shifting. These effects are statistically highly significant but rather small in size. Source level taxation seems to be more important to the MNE than taxation in its parent country concerning leverage. Corporate taxes seem to matter more than withholding taxes, hinting at the use of conduit companies in third countries.
Jugurnath, Stewart, Brooks (2008)	Annual cross-section data from 1982 to 1992. The Datastream international company accounts database (DICA) serves as the applied firm-level dataset.	The identification is mainly based on Australia adopting a dividend imputation system in 1987 and the US employing the 1986 Tax Reform Act (TRA). The paper traces the effects of dividend taxation on the level of corporate capital investment, on proxies for corporate tax rates, financial leverage, liquidity, capital intensity, and on firm size.	The paper concludes that dividend imputation as introduced in Australia is an effective way to reduce the distortions caused by the traditional system of taxation. Secondly, compared to the US TRA, dividend imputation has been better able to positively stimulate corporate capital investment. The TRA effect on corporate investment seems to be more pronounced in the US for firms having a net operating loss.
Neumayer (2007)	Bureau of Economic Analysis panel data set on U.S. outbound FDI for the years 1970-2001	Fixed-effects estimation; Dependent variables: logged FDI stock, logged FDI stock share; Independent variables: double tax treaties, bilateral investment treaties.	Developing countries benefit in form of a higher FDI stock (up 22%) and a higher share of FDI stock (up 20%) originating from the U.S. if they sign a double tax treaty with the U.S.
Poterba (2004)	Weighted average marginal tax rate series from 1929 till 2003. The share of equity owned by households, the weighted average household marginal tax rate on dividends, and the weighted average investor tax price are shown one by one.	Using information from the US flow of funds accounts and income statistics, the combined statutory tax rate consisting of both federal and state tax elements is grossed up to a weighted average of tax burdens on various investor categories. This info is used to conclude on the elasticity for the affected shareholder's tax change in 2003.	The Job Growth of Taxpayer Relief Reconciliation Act (JGTRRA) of 2003 reduces the individual tax burden on the sale of stock and on distributed dividends. It should raise the after-tax value of dividends relative to capital gains by more than five percentage points. The time-series estimates suggest an elasticity of more than three, and imply that the recent tax reform could ultimately increase dividends by almost twenty percent.

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Smart (2010)	Outbound panel data set of Canadian multinationals. The FDI data are from official Canadian government sources, and cover investments into 94 countries over the 1976–2008 period.	The goal is to estimate the effects of host country taxes and repatriation taxes on outbound FDI stocks. The paper uses a tax-treaty indicator variable as an instrumental variable for repatriation tax in order to overcome endogeneity and measurement issues.	Canadian tax treaties that involve a reform from residence-based taxation to exemption have increased investment into the affected countries by 79 per cent on average. The resulting tax rate elasticity is large and significant. Thus, Canada's general hybrid system of international taxation has distorted investment decisions and entailed a substantial loss of profitability to Canadian MNCs.
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7. Form Follows Function?

- Evidence on tax savings by multinational holding structures^{75 76}

Abstract: I provide evidence on the group structures of multinationals and analyze to what extent these structures are tax efficient. While the corporate income tax can hardly be avoided if a subsidiary is active in a country, withholding taxes depend on the structure in which the subsidiary is embedded. By vertically inserting holding companies or adjusting the superior/subordinate relationship of subsidiaries, multinationals can often influence their total tax burden, especially regarding the repatriation of profits by means of dividends. I analyze group structures across 58 countries in the years 1996 to 2008 using the MiDi database provided by the German Central Bank (*Deutsche Bundesbank*). The results show that a higher withholding tax between two members of a group located in different countries increases the probability of indirect participation. However, in about half of the observations, the existence of an intermediate subsidiary does not lower the overall tax burden, and in 5% of the cases the tax burden on repatriated profits with such a holding company is even higher than without it. Although group structures generally seem to be tax driven, there are non-tax influencing factors which sometimes prevail. Besides drivers of the vertical company structure, I provide evidence of a horizontal driver: once a form of group taxation is available, groups seem to spread their national investments across more subsidiaries.

Keywords: Corporate Taxation, Foreign Direct Investment, Holdings, Multinational Firms, Withholding Taxes

JEL Classification: F23, H25, H32

⁷⁵ In August 2012, the paper has been published as ZEW Discussion Paper 12-057. As of autumn 2012, it is under review for the journal *Schmalenbach Business Review*. In 2012, the paper has been presented at the empirical tax and accounting PhD research seminar at the University of Mannheim.

⁷⁶ I thank the German Central Bank for granting access to the MiDi database and for its hospitality at the Bundesbank Research Centre. Financial support by the German Science Foundation (DFG) is gratefully acknowledged.

7.1 Introduction

Form follows function is a principle usually associated with modern architecture and industrial design.⁷⁷ According to that principle, the shape of a building or an object should be primarily based on its intended function or purpose. In this article, I analyze the extent to which the form of multinational groups follows the function of minimizing tax payments.

By cutting the tax wedge, the legal minimization of avoidable tax payments, *ceteris paribus*, leads to higher after tax net profits, which can be considered the basic goal of a corporation. By introducing holdings or adjusting the superior/subordinate relationship of subsidiaries in different countries, multinationals can shape their tax duties. Therefore, the kind of architecture I have in mind refers to the structuring of multinational groups.

The setup of a multinational group structure is determined by many influencing factors. Organizational considerations and aspects in order to avoid principal agent conflicts can play a role and might demand a structure differing from the tax optimal one. I provide empirical evidence on multinational structures and I analyze to what extent they are tax optimal. This allows me to draw conclusions on the role and weight of tax aspects for multinationals. In the theoretical literature, the assessment of the tax impact on corporate decisions varies from negligible to paramount. On the one hand, practitioners say that the tax department only serves as an enabler of the ongoing business and that managers on all levels have EBIT incentives. On the other hand, in public perception, multinationals are often thought of as avoiding taxes by utilizing tax havens and clever structures.

My identification of group structures adds some levels of detail to previous prominent studies dealing with the topic such as Desai, Foley and Hines (2002) and Mintz and Weichenrieder (2010). These and others are summarized in a short literature review in this section. In Section 2, I provide an insight into those descriptive variables derived from the MiDi database which are of general interest and into those which I think are new to the literature. My new aspect particularly refers to the exact identification of the length and elements of holding chains. Following, in Sections 3 and 4, I develop and test hypotheses dealing with tax effects on the group structure and present several sensitivity tests and variations. Finally, Section 5 concludes with a summary of the results.

⁷⁷ The phrase dates back to 1896 when architect L.H. Sullivan used it in his essay “The tall office building artistically considered.” It was republished in *The Craftsman* in 1905 titled “Form and function artistically considered”.

7.2 Literature Review

There is some existing literature analyzing holding chains from a tax perspective. Mintz and Weichenrieder (2010) provide a comprehensive overview of multinational holding structures. Their work provides a fine insight into repatriation strategies and shows detailed descriptive empirical evidence based on the MiDi database.

Desai, Foley and Hines (2002) analyze the role of chains of ownership for U.S. based firms operating abroad. They gather empirical evidence from the annual survey of U.S. Direct Investment Abroad by the Bureau of Economic Analysis and conclude that indirect participation of foreign operations has become more and more popular. Even in their data from 1997, already 30% of aggregate foreign assets were held indirectly via some kind of holding company. In addition, according to the evidence found by Desai, Foley and Hines (2002), the concentration of ownership chains is particularly high in Europe.

Mintz (2004) pays particular attention to the holdings' function as financing hubs. Multinationals are supposed to use these conduit entities for means of indirect debt financing instead of directly providing the loans to operative subsidiaries. So-called conduit countries, as Mintz (2004) puts it, can be identified by their large amounts of both capital inflows and capital outflows. The paper provides a concise model and some descriptive indications, but abstains from empirical evidence on a micro level.

Hines and Rice (1994) provide an insight into the role of tax havens serving as holding countries for U.S. multinationals. According to them, these locations played a paramount role in the late 1980s, accounting for more than a quarter of U.S. foreign investment and nearly a third of U.S. profits. Desai, Foley and Hines (2006a) present more current evidence on the aspect of tax havens. They show empirical evidence that international firms with leeway regarding their transfer prices are most likely to use tax havens. Tax haven countries seem to fulfill two tasks: allocating taxable income away from the high-tax jurisdiction and facilitating deferral of foreign income in the credit country.⁷⁸ Dharmapala and Hines (2009) identify the factors determining whether a country becomes a tax haven or not. Apart from low tax rates as an obvious attractor, they make out the quality of governments as particularly attractive to multinationals.

⁷⁸ Desai, Foley and Hines (2006b) provide a model for analyzing to what extent tax havens divert economic activity.

I would like to mention that there are extensive studies on the impact of taxes on the size of foreign direct investments. The meta studies of De Mooij and Ederveen (2003) as well as of Feld and Heckemeyer (2009) provide overviews of some of the seminal works in this field. This paper, however, is not about the level but about the form of investments. Thus, leaving aside investment size aspects, it fully concentrates on how taxes influence the structure of multinational groups.

7.3 Data and Descriptive Statistics

7.3.1 Data

The empirical analysis uses the *MiDi* database for multinationals, which is provided by the German Central Bank (*Deutsche Bundesbank*). The comprehensive micro database covers information on both direct investment positions held in Germany by foreign investors and direct investment positions of German investors held abroad. The data allows me to identify the structure of groups and to trace it over time. In this paper, I use micro panel data for the period from 1996 to 2008. The data collection is imposed by German law, which requires reporting for certain international transactions and positions.⁷⁹ This aspect of *MiDi* is worth emphasizing, as I am thus able to observe virtually all major German outbound investments. In this study, I only analyze subsidiaries which are located outside Germany and are owned by a group with its headquarters in Germany.⁸⁰ I consider a sample of subsidiaries located in 57 countries. My sample consists of the four BRIC countries⁸¹, 29 countries which were members of the OECD in 2008⁸², and the eight EU member states which were not OECD countries in 2008.⁸³ In order to complete the picture of conceivable group structures, I additionally include some tax havens⁸⁴ and those other larger economies showing substantial

⁷⁹Sec. 26 of Foreign Trade and Payments Act (*Aussenwirtschaftsgesetz*) in connection to the Foreign Trade and Payments Regulation (*Aussenwirtschaftsverordnung*). Since 2002, FDI has to be reported if the participation is 10% or more and the balance sheet total of the respective foreign investment in Germany exceeds EUR 3 million. For details see Lipponer (2008). Though previous years showed lower threshold levels, I apply this one uniformly for all years in the panel. For general interpretations of the dataset from a tax and finance perspective see Mintz and Weichenrieder (2010).

⁸⁰I exclude observations from mining, agriculture, non-profit and membership organizations because special tax regimes may be available. Furthermore, I exclude observations whose German parent is not an incorporated and legally independent entity, as well as subsidiaries which are not legally independent.

⁸¹The BRIC countries are Brazil, Russia, India, and China.

⁸²These covered OECD countries in 2008 are Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

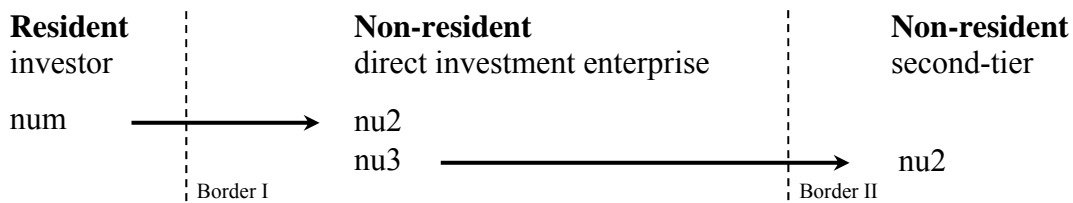
⁸³These EU countries are Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Slovenia, and Romania.

⁸⁴These tax havens are the Bermuda Islands, the Cayman Islands, the Dominican Republic, Hong Kong, Liechtenstein, and Singapore.

investment stocks.⁸⁵ While the headquarters of the multinational groups covered in my dataset are always located in Germany, I can also observe investments in directly held subsidiaries and in indirectly held subsidiaries if they are held by 100 percent.

For this study, I only take into consideration 100 percent participations concerning both directly and indirectly held subsidiaries. In the first part of the paper I disregard country holdings, since they add no additional information to the international setup of the group. Only when dealing with the presence of a group taxation rule country holdings taken are into account, as they can be used to net the profits and losses of the national subsidiaries.

From the data in the MiDi dataset, I have managed to reconstruct and identify the exact group concerning 100 percent participations. The dataset only uses two unique identifiers for its directly and indirectly held outbound subsidiaries.⁸⁶ These numbers, titled “nu2” and “nu3”, have attached country information and are organized as follows:



The crucial aspect for my identification is that each “nu3” is a “nu2” in another line of the dataset. With this information, I managed to reconstruct the entire group structure concerning 100 percent participations. For each observed subsidiary, I could spot its exact location in the overall group structure.

What can we make of this information? Descriptively, I can show the length and width of group structures and trace them over time. Although it is not permissible to infer cause-and-effect relationships from these descriptive statistics, their observation over time is interesting. There are some drivers suggesting more complex and sophisticated holding structures over time and some working against the very same development. The internationalization of business and the increased size of multinational groups are supposed to cause more complex holding structures. By contrast, generally sinking or even vanishing withholding taxes imply leaner structuring, as tax-motivated holding structures from the past might become obsolete.

⁸⁵ These additional countries are Chile, Colombia, Croatia, Indonesia, Malaysia, Peru, Taiwan, Thailand, the United Arab Emirates, and Uruguay.

⁸⁶ See Lipponer (2008) for further details on the MiDi dataset.

For my empirical estimations I use the withholding tax rates on dividends. A multinational firm has different means to repatriate profits,⁸⁷ either by paying interest on previously provided intercompany loans, by paying royalties or by distributing intercompany dividends. The latter can be considered the most important one in terms of volume and also in the potential sensitivity to tax treaty regulations.⁸⁸ That is why I focus on repatriation via dividends in this paper. In addition to the simple withholding tax rate, I also regard the method of how the interest or dividend is treated in the receiving country, i.e. whether it is tax exempt, the tax is credited or deducted, or if there is double taxation. For each year, each single country pair is considered. Altogether, each of the four required matrices of withholding tax relationships show 58-by-57 combinations each for 13 years resulting in 42,978 observed values.⁸⁹ Changes in the withholding tax rates influence the tax efficiency of holding structures in the respective sphere. Still, my identification strategy regarding the tax efficiency of group structures builds as much on those withholding tax relationships that remain unchanged as on those that were changed. This results from analyzing the tax savings potential of intermediate subsidiaries for each year of the dataset. Put differently, my analysis is dynamic in the sense that it perceives the status of each group structure in each single year.

7.3.2 Descriptive Statistics

I first present an overview of the length of holding chains and the width of group structures over time. General drivers of the supposed development have been put forward above.

Concerning the length of holding chains, I identify seven vertical levels at maximum. A chain so long, however, rarely appears in the dataset. About 70% of all subsidiaries are directly held by the mother, some 24% are held via one intermediary subsidiary, and the remaining 6% are held via two or more subsidiaries.

Across all considered years, the average group observable in the dataset consists of about 4 subsidiaries. Between 1996 and 2008, the average number of subsidiaries per group increased from 3.55 to 4.50. Table 7-1 below provides further descriptive insight into group structures.

⁸⁷Altshuler and Grubert (2003) provide an overview of the repatriation strategies available to multinationals. The general distinction of how profits may be repatriated and the conclusion that there is a trade-off for the subsidiary between reinvesting or transferring excess funds to the parent company are in line with the rationale put forward by Altshuler and Grubert (2003).

⁸⁸Tax treaties also limit the tax withhold if intercompany interest or royalties are paid. Tax savings are, however, very unlikely because these types of income tax treaties or national tax legislation usually consider a credit system, whereas the foreign tax credits only include withholding taxes since interest and royalty expenses are deductible.

⁸⁹See Tables 14 and 15 in the Appendix for an excerpt of the matrix. The full dataset is available upon request.

Table 7-1: Top 20 subsidiary locations in the sample

Subsidiary Country	Observations	Domestic	Country #1	Country #2	Country #3
United States	4.865	4.514	Switzerland (95)	Netherlands (78)	UK (31)
United Kingdom	3.362	2.916	Denmark (207)	Netherlands (160)	Sweden (66)
France	3.100	2.585	Netherlands (188)	Switzerland (93)	Luxembourg (67)
Spain	1.800	1.319	Netherlands (141)	Switzerland (134)	France (67)
Netherlands	1.773	1.519	Switzerland (103)	Belgium (36)	Spain (14)
Italy	1.452	960	Netherlands (157)	Switzerland (122)	France (98)
Austria	1.168	910	Switzerland (120)	Netherlands (67)	Luxembourg (17)
Switzerland	1.115	792	Netherlands (165)	Austria (52)	France (29)
Belgium	816	349	Netherlands (262)	France (68)	Switzerland (53)
Australia	636	378	Netherlands (63)	Switzerland (63)	United States (34)
Sweden	601	356	Netherlands (82)	UK (61)	Switzerland (45)
Canada	557	202	United States (224)	Netherlands (61)	Switzerland (39)
Brazil	461	241	Switzerland (55)	Netherlands (32)	Spain (47)
Czech Republic	448	117	Austria (170)	Netherlands (99)	Switzerland (40)
Mexico	416	178	United States (135)	Netherlands (25)	Spain (21)
Denmark	398	207	Sweden (66)	Switzerland (52)	Netherlands (40)
China	398	132	Hong Kong (86)	Singapore (47)	Switzerland (46)
Ireland	394	160	Netherlands (64)	UK (47)	United States (29)
Poland	376	149	Netherlands (81)	Austria (70)	Switzerland (19)
Hungary	361	139	Austria (156)	Netherlands (40)	Switzerland (16)
Observations	24,497	18,123			

This table shows the 20 countries where most of the observed subsidiaries of the sample are located. The column *Domestic* depicts the observations where the observed subsidiary is held by a country holding. The three columns to the right show the three countries where most of the holdings of the respective country's subsidiaries are located. The number in brackets shows the respective number of total holding observations. For example, I count 4.865 subsidiary observations in the USA between 1996 and 2008; 4.514 of which are held by country holdings. Most of German multinationals' US subsidiaries, which are not nationally held, are held by holdings in Switzerland with 95 holding observations in total. The second most popular holding country for US subsidiaries is the Netherlands, followed by the UK.

The table above displays which countries serve as a host for many holdings. It shows how many holdings are located in the respective country. This overview of holding countries above is very general. In the development of my hypotheses, I will outline in detail that the justification to install a holding company depends on the location of the operating subsidiary. This can be explained by different withholding taxes depending on which country dividends are paid to. Besides withholding taxes, other aspects, such as the geographical distance, the investment risk or the respective currency, might also influence a country's attractiveness as a holding location and are maybe even more obvious. The size effect of the individual influencing factors will be worked out later. In this descriptive section I already provide an insight into good holding locations given the location of the operating company. In other words, Table 7-1 above shows the preferred holding countries depending on the respective subsidiary's location – regardless of *why* they are the preferred countries. Table 7-2 below provides explanations and descriptive statistics of all the relevant variables used in this study.

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Table 7-2: Variable descriptions

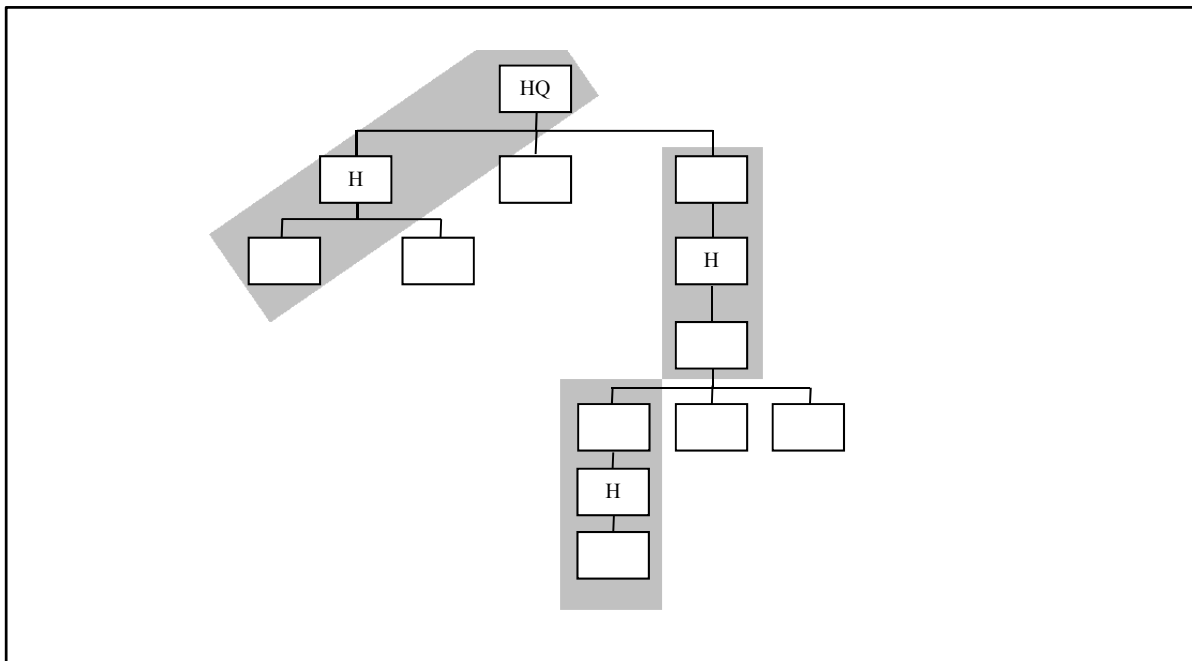
Variable	Description	Mean	Std. Dev.
Fixed Assets	Fixed and intangible assets in the financial statements; in EUR '000.	34,260	373,210
Group's Fixed Assets	Fixed and intangible assets of a group's subsidiaries; in EUR '000.	112,410	973,585
Holding	Binary variable distinguishing whether a subsidiary is a holding based on its NACE code (1) or not (0).	.086	.278
Superior	Dummy indicating if a subsidiary has a unit below it (1) or not (0).	314	464
Held Directly	Binary variable distinguishing whether the foreign subsidiary is held directly (1) or indirectly (0).	.686	.464
Affiliate Number	Number of a group's subsidiaries	26.26	43.12
Tax Rate	Statutory profit tax rate.	.331	.068
Withholding Tax	The statutory withholding tax on dividends repatriated from abroad to a qualifying superior firm unit. It is the smallest of the domestic rates and the rate of an effective tax treaty.	.009	.035
WHT to Germany	The statutory withholding tax on dividends repatriated from abroad to a qualifying firm in Germany.	.014	.031
Repatriation Tax	The additional tax that needs to be paid effectively on repatriation. Differs from <i>Withholding Tax</i> due to recognition of the credit system and the company tax.	.014	.046
Total Tax	The total tax to be paid additionally to the corporate income tax on the lowest level when repatriating dividends from one subsidiary via another subsidiary to a superior firm unit.	.019	.059
Counter Total Tax	The hypothetical equivalent to <i>Totaltax</i> if the intermediate subsidiary were non-existent.	.037	.052
Holding Advantage	The difference of <i>Totaltax</i> minus <i>Countertotaltax</i> with negative values showing that the holding reduces taxes.	-.020	.050
Thin Cap Rule	Binary variable if a country has a thin cap rule (1) or not (0).	.753	.432
Holding Regime	Binary variable distinguishing whether such a special regime is in place in that country (1) or not (0).	.377	.485
Group Taxation	Dummy distinguishing if a country has group taxation (1) or not (0).	.759	.427
Euro	Binary variable distinguishing whether the currency of the respective country is the euro (1) or not (0).	.485	.500
EU27	Binary variable distinguishing if a country belongs to the 27 EU member states (1) or not (0).	.631	.482
OECD	Binary variable if a country is an OECD member (1) or not (0).	.953	.211
Distance to Germany	The distance of the subsidiary to Germany in km '000.	4.677	4.726
Counterdistance	The distance between two subsidiaries km '000, disregarding the intermediate subsidiary between them.	2.799	3.659
GDP	Gross Domestic Product measured in billion USD.	2.218	3.615
GDP per Capita	GDP per home country; measured in current USD '000.	29.363	15.372
Inflation Rate	Inflation rate based on consumer prices.	2.53	7.33
Country Risk	OECD Country Risk Classification Method measures the country credit risk from a low credit risk (0) to a high credit risk (7).	.189	.764

The values are generally based on the 134,630 observations used in testing Hypothesis H7-1. Regarding those variables only required for testing Hypothesis H7-4, they are based on the 46,368 observations used there. The firm-specific variables in the table's upper part are derived from the MiDi database of the German Central Bank. The tax variables in the middle of the table are derived from information taken from the IBFD Tax Handbooks, the Worldwide Corporate Tax Guides by Ernst & Young, and by the individual bilateral tax treaties. *GDP*, *GDP per Capita* and *Inflation Rate* stem from the World Development Indicators, edition 2009. *Country Risk* is based on information provided by the OECD.

7.4 Development of Hypotheses

I observe and analyze the group structures of multinationals. As pointed out in the section above, I have been able to fully identify those group structures. This information is required in order to calculate the total tax burden imposed on a dividend repatriated from a subsidiary on the lower levels of the group structure to the headquarters. For basic hypotheses, however, the information has to be brought to a feasible form. Whether or not the existence of a holding is beneficial from a tax point of view can already be determined by looking at parts of the total structure. Regardless of its complexity, the structure can be deconstructed into chains with three elements. I show this in the following example:

Table 7-3: Identification method by group structure split up



“HQ” stands for the group’s headquarters. The subsidiaries denoted by an “H” are some of the possible holdings in this exemplary group structure. In the estimations and descriptives further below, each subsidiary with at least one company unit above and at least one below it is considered as an intermediary/holding subsidiary.

The example shows a group structure with the headquarters at the top and several subordinated subsidiaries. As I disregard country holdings in this first part of the paper, each subsidiary on a different horizontal level is located in a country different from the country of the subsidiary preceding or following it. Each subsidiary which has at least one unit above and one unit below it in the corporate structure can be regarded as a holding company. Nevertheless, the example only titles some of the conceivable holdings with an “H” to avoid confusion and shows some of the bundles which need to be analyzed in order to assess the tax value of a holding. The hypothetical situation of a holding company’s non-existence needs to

be compared to the given situation. In the hypothetical situation, the subsidiary below the holding would distribute its profits directly to the unit above the holding. Neither the actual nor the hypothetical situation is affected by the other levels of the group structure. Therefore, by comparing the total tax burdens on a dividend distributed within the respective grey box in the factual vs. the fictitious case already reveals the tax benefit brought in by the holding.⁹⁰

A multinational has two general means of repatriating profits from its foreign subsidiaries: either by demanding interest for previously granted loans or by calling for dividends. As outlined above, I focus on the latter channel in this paper. Withholding taxes can be an important aspect of multinationals' profit taxation. I provide an overview of their position and contribution in the international tax system. The headquarters and the subsidiaries are located in different countries. Furthermore, I assume profits. A tax rebate from the headquarter level to the subsidiary level is excluded. The following table shows the calculation of the tax burden at the level of the subsidiary and of the additional tax at the level of the superior company.

Table 7-4: Tax burden on subsidiary level and additional tax burden on repatriation

	1. Exemption:	$\text{add} = t_{\text{HQ}} * (1 - \text{Tax Burden}_{\text{SUB}}) * (1 - \text{Exemption in \%})$
HQ	2. Indirect credit:	$\text{add} = t_{\text{HQ}} - \text{Tax Burden}_{\text{SUB}}$
|	3. Direct credit:	$\text{add} = (t_{\text{HQ}} - \text{WHT}_{\text{SUB}}) * (1 - t_{\text{SUB}})$
|	4. Deduction:	$\text{add} = t_{\text{HQ}} * (1 - t_{\text{SUB}} - \text{WHT}_{\text{SUB}})$
|	5. Double:	$\text{add} = t_{\text{HQ}}$
SUB	$\text{Tax Burden}_{\text{SUB}}$	$= t_{\text{SUB}} + (\text{WHT}_{\text{SUB}} - t_{\text{SUB}} * \text{WHT}_{\text{SUB}})$

The total tax burden depends on the corporate tax rates at the level of the subsidiary and at the level of the superior company unit, the withholding tax levied when profits are repatriated via dividends, and the method the country of the superior unit uses to recognize previously taxed profits. The superior unit can either be another subsidiary of the group or it can be the firm's headquarters.

The formulas are analogously applicable to the scenario when two subsidiaries of different host countries are vertically integrated into the group structure. As can be seen in Table 7-4, the impact of the withholding taxes depends not only on the size of the withholding tax (WHT) itself, but also on the corporate income tax rates (t) at the subsidiary and the mother

⁹⁰ For example, if the top unit is located in Germany and the lower unit is located in Japan, the introduction of a Dutch holding between these two units reduces the withholding tax due from 10% to 5% altogether. This is due to the fact that Japan levies a 10% withholding tax on dividends distributed to Germany, but only 5% on those dividends distributed to the Netherlands. The Netherlands do not claim a withholding tax on dividends distributed to Germany.

company level, as well as on the method dividends are recognized through in the country of the headquarters. I show the tax burden on an investment of a foreign subsidiary and the additional tax burden on repatriated dividends in the country of the headquarters. The formula on the level of the subsidiary shows that first the corporate income tax is applied and then the withholding tax is levied on the remaining net amount which shall be distributed as dividends. The formulas on the level of the headquarters show the five conceivable ways repatriated dividends might be handled. The possibilities range from the most generous treatment of a – possibly partly – exemption to the least advantageous double taxation. The direct and indirect credit systems differ insofar as the direct credit system only credits the withholding tax and deducts the corporate income tax paid on the subsidiary level, whereas the indirect credit system credits both of these previously paid taxes to the tax burden at the headquarter level. In the deduction case, both the withholding tax and the corporate income tax are deducted from the second level tax base.⁹¹ Please refer to the Appendix for a more detailed description of methods to avoid double taxation and repatriation taxes.

Both the example on the corporate structure and the formulas for the tax burden show that the tax savings potential of a holding company stems mainly from its ability to reduce the applicable withholding taxes on distributed profits. The maximum savings potential of a holding structure is determined by the withholding tax which would be applicable if the holding was non-existent. Put differently, if there is only a low or even no withholding tax on distributions between two units in two different countries, there is only little or even no potential tax benefit of interposing a holding between these two units. Based on these considerations, I set up the following hypothesis:

H7-1: A low withholding tax on dividends between the country of a subsidiary and the country of its superior foreign unit in the group structure reduces the probability that this subsidiary is held indirectly.

In the first hypothesis, I focus on the general tax savings potential which can be realized by the establishment of a holding. Once I assume that the withholding tax levied on distributed dividends between two units is different from zero, the actual savings brought about by a

⁹¹ For models on the country's rationale behind the chosen method of foreign capital income repatriation, see Janeba (1996), Mintz and Tulkens (1996) and Dickescheid (2004). Hines (1994) works out and provides empirical evidence that the credit system, as applied by the United States for example, provides incentives to finance foreign subsidiaries with considerable debt and to restrict the equity stakes in new foreign investments.

holding is strongly influenced by the withholding tax rate applicable on dividends distributed from the holding country to the superior unit. If this rate is high, any savings made on the first level are in vain. Therefore, especially those countries which have established treaties guaranteeing low withholding taxes on outgoing dividends are supposed to serve as the holding hubs. This consideration is the basis for my second hypotheses:

H7-2: Operative subsidiaries are held via subsidiaries located in countries with low withholding taxes towards the country of the superior foreign-based company unit.

The two hypotheses above aim at analyzing the intermediate subsidiaries which have been set up to enable tax-efficient profit repatriations by means of dividends. In my third hypothesis, I would like to take a closer look at such subsidiaries. A group can either use its established manufacturing subsidiaries to redirect dividends or it sets up new subsidiaries particularly fulfilling holding functions. Given that a group might not have operative active subsidiaries in the best conduit countries and orienting by the title of this paper, I set up the following hypothesis:

H7-3: It is pure holding companies and not active subsidiaries which are used for group structuring.

As pointed out above, I identified the whole group structure. The additional information available through this identification allows me to get a better insight into the tax savings which are actually realized by holding structures. My first three hypotheses shall provide initial evidence for groups using holdings in a tax-efficient way. Put more cautiously, the answers to these hypotheses shall show in general that holdings are at least not harmful from a tax point of view. The question about the size effect of the holding-induced tax savings, however, can only be answered by comparing the actual tax burden with the hypothetical tax burden if the intermediate holding was non-existent. Therefore, I set up the following hypothesis regarding the overall impact of holding structure applications:

H7-4: Holding companies are applied as a way to lower the overall tax burden on dividends paid from a subsidiary to the group's headquarters or to another superior company unit.

Although holdings are applied more or less in line with general tax considerations, as I will show in the results below, the size effect of the savings is disillusioning. Especially in light of

the comprehensive theoretical and analytical literature on tax planning via holdings, the actual size of tax savings might have been expected to be higher. I mainly referred to the tax benefits which could be realized in the case of full and immediate distribution of dividends. There are, however, tax effects which might be valued by the multinational, but rather materialize as options. A comprehensive setup of double taxation treaties, a location within the European Union, a holding regime or a stable currency might be appreciated by the multinational in view of plans for future expansion. Therefore, in my fifth hypothesis, I include both additional aspects related to taxation as well as non-tax effects such as proximity or a country's investment risk. The fifth hypothesis aims at answering the question about determinants of a good holding location. Given that the holding location depends on the location of the subordinated subsidiary, I apply a count data model inspired by Winkelmann (2008). For the inclusion of multiple influencing factors on the location decision, I formulate the following hypothesis:

H7-5: Besides the withholding tax, other tax and non-tax effects contribute to determining a good holding location given the location of the operating subsidiary.

The five hypotheses above deal with vertical group structuring. In addition, there are conceivable tax influences on the horizontal structuring of investments as well. Both country holdings and national sister subsidiaries are to be included when focusing on the horizontal group structure. If a country provides tax loss consolidation rules, a group could structure its investments by means of different separate legal entities. A multinational firm can split up its investments according to risks or business segments and, in doing so, benefit from limited liability. A well-structured group of several subsidiaries in a country is likely to be appreciated by providers of capital. Becker and Fuest (2007) analytically show that symmetric taxation alone might ensure only partial neutrality because aspects of limited liability have to be taken into account. In a group relief system, for example, losses can be offset for tax purposes while there is no need to effectively compensate the loss suffered by an affiliated company. Thus, the advantage of a possible tax loss offset comes free of any clearing requirements. In countries without a group taxation regime, however, the only way to ensure loss offsetting between different parts of the firm is by incorporating all business activities into one legal entity. Therefore, I set up the following hypothesis regarding the impact of a group taxation regime on the structuring of investments:

H7-6: *The number of subsidiaries per country established by a parent company is higher in those countries providing consolidation of taxable profits and losses of affiliated firms, i.e. those countries providing a group taxation regime.*

7.5 Estimation Approach and Regression Results

7.5.1 Withholding Taxes and Vertical Integration

Tracing H7-1 and H7-2, I analyze the probability that a subsidiary is indirectly held by a superior company unit. The superior company unit can be another subsidiary or the headquarters. Formally, the decision of the superior unit j to indirectly hold a subsidiary i located in country c in year t is modeled as a discrete choice decision problem and is captured in an econometric model using a standard latent variable framework. To keep it simple, when tracing H7-1 to H7-3, I focus on the three-unit holding chains with the German headquarters at the top and thus reduce the complexity by concentrating on the withholding tax to Germany. The observable decision to use either a holding h_{jt} , or to directly hold the subsidiary is related to the latent predisposition to use the holding, y_{jt}^* , according to $y_{jt} = 1[y_{jt}^* > 0]$ where $1[\cdot]$ is the indicator function. The parent's predisposition towards using more than one subsidiary per host country is a function of the existence of the withholding tax between country c_1 and c_2 and a vector X of firm- and host country-specific characteristics, a common period-specific effect γ_t , an unobservable parent-specific effect p_j , and a residual $\varepsilon_{j,h,t}$. Choosing a linear specification for the latent variable provides us with

$$y_{jt}^* = \beta_1 \text{Withholding Tax}_{c1,c2,t} + X_{it}\beta_2 + \gamma_t + p_j + \varepsilon_{jht} \quad (7-1)$$

where β_1 and β_2 are the (vectors of) coefficients to be estimated. I apply a fixed-effects logit model (Chamberlain, 1980) for this estimation.⁹² The fixed-effects model assumes that the error $\varepsilon_{j,h,t}$ is distributed symmetrically around zero, with accumulative distribution function G . The binary response model thus takes the form

$$\begin{aligned} P(y_{jt} = 1 | \text{Withholding Tax}_{c1,c2,t}, X_{jt}, c_j) &= P(y_{jt}^* | \text{Withholding Tax}_{c1,c2,t}, X_{jt}, c_j) \\ &= G(\beta_1 \text{Withholding Tax}_{c1,c2,t} + X_{it}\beta_2 + \gamma_t + c_j) \end{aligned} \quad (7-2)$$

When dealing with H7-4, the effective additional or reduced tax burden replaces the nominal withholding tax rate in equation (7-2). The effective burden is calculated as outlined in Table 7-4. Concerning H7-5, further variables are included in X_{jt} such as a country's investment risk, the existence of a holding regime or the distance between the lower and the superior unit.

⁹² A concise introduction to the logit model is provided by Winkelmann (2009).

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Table 7-5: Impact of withholding taxes on (in)direct structuring

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>OLS without group-fixed effects</i>								
WHT to Germany	-.051 (.082)	-.204*** (.076)	-.250*** (.072)	-.249*** (.072)	-.278*** (.075)	-.268*** (.073)	-.159** (.074)	-.266*** (.073)
Group Tax Regime		-.105*** (.088)	-.073*** (.010)	-.072*** (.010)	-.082*** (.011)	-.078*** (.010)		-.078*** (.010)
(ln)GDPperCapita			-.040 (.006)	-.040*** (.006)		-.035*** (.008)	-.041*** (.008)	-.035*** (.008)
Inflation				-.001 (.018)	-.006 (.019)		-.028 (.023)	.002 (.019)
OECD countryrisk					.020*** (.004)	.002 (.005)	.013*** (.004)	.002 (.005)
Observations	134,630	134,630	134,630	134,573	134,217	134,274	134,217	134,217
Adjusted R ²	.0014	.012	.016	.016	.015	.016	.012	.016
F-test	.073	10.60	13.22	14.08	15.01	15.06	9.39	14.94
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>OLS with group-fixed effects</i>								
WHT to Germany	.167*** (.061)	-.005 (.061)	-.017 (.061)	-.019 (.062)	-.038 (.062)	-.036 (.062)	.054 (.061)	-.037 (.062)
Group Tax Regime		-.082*** (.007)	-.072*** (.007)	-.072*** (.007)	-.071*** (.007)	-.070 (.007)		-.071*** (.007)
(ln)GDPperCapita			-.013*** (.005)	-.013*** (.005)		-.004 (.007)	-.009 (.007)	-.004 (.007)
Inflation				.023 (.024)	.010 (.017)		-.013 (.013)	.000 (.000)
OECD countryrisk					.009*** (.002)	.007** (.004)	.017*** (.003)	.007* (.004)
Observations	134,630	134,630	134,630	134,573	134,217	134,274	134,217	134,217
Adjusted R ²	.408	.412	.413	.385	.384	.384	.382	.384
F-test	1.89	12.12	11.41	10.91	11.95	13.56	7.84	12.83

The dependent variable is whether the foreign subsidiary is held directly (1) or indirectly (0) by its German mother. The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimations in columns (9) - (16) include group-fixed effects. *, **, and *** show significance at the level of 10%, 5%, and 1 %.

Confirming Hypothesis H7-1, the results in columns (2) to (8) of Table 7-5 show that a higher withholding tax of a subsidiary belonging to a group headquartered in Germany reduces the probability of direct participation. Put differently, holdings are generally established at positions of the group structure where they can at least potentially cause savings in withholding taxes. As stated above, this refers to the repatriation via dividends, which can be considered the most important as well as the most treaty-sensitive channel. The size effect of -.266 in column (8) of Table 7-5 means that a ten percent increase in the withholding tax towards Germany reduces the probability of direct participation by 2.66 percent. The results

in columns (2) to (7) show that the effect is not driven by a particular combination of the controls, but persists even if one or more of them are left out. As can be seen from the lower part of Table 7-5, however, the result that high withholding taxes to Germany increase the likelihood of a subsidiary to be held indirectly loses its significance once group-fixed effects are controlled for. In columns (10) to (14) and in column (16), which includes all the relevant control variables, despite a lack of significance, at least the expected negative sign persists. The change in results when including group-fixed effects compared to the upper part of Table 7-5 indicates that there are groups with and other without the motivation to indirectly hold subsidiaries, and that this basic distinction does not leave enough room for the individual withholding tax and its change over time to play a significant role.

The coefficients observable at the control variables are as expected. An existent *group tax regime* reduces the motivation to indirectly hold a subsidiary because some netting of profits and losses and profit reallocation can already be carried out on the national level. The negative effect of the *GDP per capita* indicates that well-established markets tend to be directly linked to the headquarters. This might rather be based on controlling considerations than on taxes. Regardless of the tax effect, those important subsidiaries producing in important established markets might want to maintain a direct link to the group's headquarters. While *inflation* is insignificant, the negative and significant coefficient of *OECD country risk* indicates that high risk countries tend to be directly tied to the headquarters rather than implementing them further down in a sophisticated group structure. Based on the need of close monitoring of such subsidiaries, this is highly plausible.

Hypothesis H7-2 takes the mirror view: the withholding taxes levied from the holding location when distributing profits to the superior company should be comparably low. The dependent variable in Table 7-6 is the withholding tax to Germany. The crucial independent variable *Superior* takes the value of one if a subsidiary has other subsidiaries below it in the group structure, and takes the value of zero if it does not. The negative coefficient of *Superior* in all columns (1) to (16) of Table 7-6 suggests that subsidiaries in locations levying high withholding taxes on dividend repatriation to Germany do not necessarily serve as conduit entities. Thus, as stated in Hypothesis H7-2, operative subsidiaries are held via subsidiaries located in countries with low withholding taxes towards the country of the superior foreign-based company unit. Hypothesis H7-2 is confirmed both in the estimations without group-fixed effects, shown in columns (1) to (8) and in those with group-fixed effects shown in columns (9) to (16).

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Table 7-6: Withholding taxes from directly vs. indirectly held subsidiaries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>OLS without group-fixed effects</i>								
Superior	-.006*** (.001)	-.004*** (.001)	-.004*** (.001)	-.004*** (.001)	-.004*** (.001)	-.004*** (.001)	-.005*** (.001)	-.004*** (.001)
Group Tax Regime		-.016*** (.003)	-.014*** (.003)	-.014*** (.003)	-.012*** (.003)	-.012*** (.003)		-.012*** (.003)
(ln)GDPperCapita			-.002 (.002)	-.001 (.002)		.002 (.003)	.001 (.003)	.002 (.003)
Inflation				.048* (.027)	.041* (.024)		.036* (.021)	.040* (.024)
OECD countryrisk					.002* (.001)	.004** (.002)	.005*** (.002)	.003* (.002)
Observations	145,905	145,905	145,905	145,848	145,354	145,354	145,354	145,354
Adjusted R ²	.029	.062	.064	.072	.074	.070	.061	.075
F-test	4.47	5.90	5.53	5.59	6.05	5.68	5.71	5.81
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>OLS with group-fixed effects</i>								
Superior	-.008*** (.001)	-.006*** (.001)	-.006*** (.001)	-.007*** (.001)	-.006*** (.001)	-.006*** (.001)	-.006*** (.001)	-.006*** (.001)
Group Tax Regime		-.014*** (.003)	-.013*** (.003)		-.012*** (.003)	-.012*** (.003)	-.013*** (.003)	-.012*** (.003)
(ln)GDPperCapita			-.002 (.002)	.001 (.003)		.002 (.003)	-.001 (.002)	.002 (.003)
Inflation				.029 (.019)	.033 (.021)		.037 (.023)	.033 (.021)
OECD countryrisk				.004*** (.002)	.002 (.001)	.003 (.002)		.002 (.002)
Observations	145,905	145,905	145,905	145,354	145,354	145,411	145,848	145,354
Adjusted R ²	.190	.211	.211	.207	.218	.215	.216	.212
F-test	5.56	6.40	5.99	5.73	6.07	5.79	5.94	5.80

The dependent variable is the withholding tax to Germany. The crucial binary independent variable *Superior* indicates whether the withholding tax is applied to a subsidiary which has at least one subordinated subsidiary (1) or not (0). The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimations in column (2) include group-fixed effects. *, **, and *** show significance at the level of 10%, 5%, and 1 %.

Just like the previous table, Table 7-7 uses the withholding tax to Germany as the dependent variable. The crucial independent variable *Holding*, however, is not based on the group structure like *Superior* in Table 7-6, but on the NACE code. Thus, *Holding* takes the value of one if a subsidiary exclusively carries out holding activities based on its industry code. The binary variable is zero if its NACE code does not label it as a holding but as some other function, such as a productive chemical plant. In this second case, the subsidiary might very well also carry out some holding functions, but it does not exclusively concentrate on them.

7. Form Follows Function

Table 7-7: Kind of subsidiaries used for group structuring

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>OLS without group-fixed effects</i>								
Holding	.003*** (.001)	.004*** (.001)	.003*** (.001)	.003*** (.001)	.004*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)
Group Tax Regime		-.004* (.002)	-.006** (.002)	-.006** (.002)	-.005** (.003)	-.005* (.003)		-.005** (.002)
(ln)GDPperCapita			.002* (.001)	.003** (.001)		.003 (.002)	.002 (.002)	.003 (.002)
Inflation				.030** (.014)	.029** (.013)		.026** (.012)	.029** (.013)
OECD countryrisk					-.001* (.062)	.001 (.001)	.001 (.093)	.000 (.001)
Observations	53,587	53,587	53,587	53,582	53,180	53,185	53,180	53,180
Adjusted R ²	.050	.052	.054	.057	.054	.054	.053	.056
F-test	4.79	7.97	7.65	7.57	8.33	7.96	7.56	7.82
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>OLS with group-fixed effects</i>								
Holding	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	.000 (.001)	.001 (.001)
Group Tax Regime		-.003** (.001)	-.005*** (.002)	-.005*** (.002)	-.006*** (.002)	-.006*** (.002)		-.006*** (.002)
(ln)GDPperCapita			.002 (.001)	.002 (.001)		.001 (.002)	.001 (.002)	.001 (.002)
Inflation				.014 (.010)	.016 (.011)		.013 (.010)	.016 (.011)
OECD countryrisk					-.001*** (.000)	-.001 (.001)	.000 (.001)	-.001 (.001)
Observations	53,587	53,587	53,587	53,582	53,180	53,185	53,180	53,180
Adjusted R ²	.306	.309	.309	.310	.312	.311	.309	.312
F-test	3.96	4.92	4.55	4.47	4.53	4.31	3.52	4.24

The dependent variable is the withholding tax to Germany. The crucial independent variable *Holding* distinguishes between whether the foreign subsidiary is a pure holding company (1) or has other purposes as well (0). The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimations in columns (5) to (8) include group-fixed effects. *, **, and *** show significance at the level of 10%, 5%, and 1 %.

The positive and significant coefficients of *Holding* in columns (1) to (8) of Table 7-7 indicate that the withholding taxes for repatriating dividends to Germany are even higher if this is carried out by pure holding companies. This opposes Hypothesis H7-3. Based on Hypothesis H7-3, a negative and significant coefficient of *Holding* was expected, since it would convey that once a company is classified as a holding firm – by contrast to some other industry type – the withholding tax to Germany is lower in relation to non-holding subsidiaries. Once group-fixed effects are included in columns (9) to (16) of Table 7-7, the *Holding* coefficient turns insignificant. Given the parent/subsidiary directive within the EU

and the many tax treaties applying zero-withholding tax rates for qualified dividends, the low average size effects are not surprising.

Based on the results from both the upper and the lower section of Table 7-7, Hypothesis H7-3 cannot be confirmed. There is no evidence pointing to the fact that it is especially pure holding companies which are used for group structuring. Based on columns (1) to (8) of Table 7-7, it seems to be the *operative* subsidiaries which have lower withholding taxes to Germany than the pure holding companies. This carefully indicates that groups rather use their active operative subsidiaries for profit redistribution. Such a setup is plausible also from a tax law perspective. The German CFC-rules, grossing up passive income to the higher German tax level, might be one reason for this phenomenon. Active income is generally not grossed up.

Hypothesis H7-4 combines the elements of the first two hypotheses. The application of a holding should, when also taking into account the tax treatment method at the superior level, effectively lead to overall tax savings. Table 7-8 provides some insights into the influence of the intermediate subsidiary on the tax burden of repatriated profits. The corporate tax on the lowest level is not taken into account, as it is definite and remains unaffected by the group structure decision. All other taxes, i.e. the withholding taxes on dividends on each level and the corporate tax on the top level(s) are considered. The recognition of repatriated profits, i.e. exemption, credit, deduction or double taxation, is considered as well.

While Table 7-8 provides a detailed insight into the size effect of tax savings by intermediate holdings, the regressions of Tables 7-9 and 7-10 further below build on these new findings. They trace which kinds of firms actually use tax-efficient constructions. In order to be able to set up such regressions, one first has to know where tax savings prevail. This is shown in Table 7-8.

All in all, the results in Table 7-8 show that while many groups do have tax benefits from their intermediate subsidiaries, conversely some others even apply tax-harmful structures. The split up into sub samples reveals that the size and multitude of tax savings is higher in the structure directly below the German headquarters than further down in the group structure. As can be seen from column (1), the tax burden in the actual case is only 1.9% at the mean. This is the result of the dividend exemption in Germany and the parent-subsidiary directive within the EU, which sets withholding taxes stemming from qualified participations to zero.

Table 7-8: Holding-induced tax burden advantage

	(1)	(2)	(3)
	All observations	German Mother-Sub-Sub	Sub-Sub-Sub
Tax Burden via Holding			
Mean	.019	.014	.034
Std. Deviation	(.059)	(.051)	(.080)
Min	0	0	0
Max	.712	.455	.712
HYPOTHETICAL Tax Burden without Holding			
Mean	.037	.038	.033
Std. Deviation	(.052)	(.042)	(.080)
Min	0	0	0
Max	.700	.370	.700
Holding's influence on the tax burden			
Mean	-.020	-.024	-.001
Std. Deviation	(.050)	(.050)	(.042)
Variance	.002	.003	.002
Skewness	2,306	2,178	4,633
Kurtosis	30,502	23,400	105,839
Tax Advantage (Percentiles)			
1%	-.170	-.170	-.15
5%	-.076	-.076	0
10%	-.070	-.070	0
25%	-.020	-.026	0
50%	-.020	-.020	0
75%	0	-.015	0
90%	0	0	0
95%	.001	.007	0
99%	.180	.185	.119
Observations	55,808	45,242	10,566

This table shows descriptive variables. Thus, there is no dependent variable. The samples reported in columns (2) and (3) are subsamples of the full set in column (1). Column (2) regards the triples of the German mother and two subordinated subsidiaries, while column (3) regards three subsidiaries. All of the subsidiaries are vertically embedded in the group structure. The *tax burden* includes all withholding taxes and corporate taxes, except for the corporate tax on the lowest considered level. In the HYPOTHETICAL case, the intermediate subsidiary is considered non-existent. The *holding's influence* is the actual tax burden minus the hypothetical tax burden.

In the hypothetical case that the intermediate subsidiary was non-existent, with a value of 3.7%, the average tax burden on repatriated profits would be almost twice as high as the actual case's 1.9%. Thus, at the mean, the intermediate subsidiaries reduce the tax burden. A look at the percentiles reveals that in about 50% of the cases, the existent group structure is beneficial, in about 45% of the cases it does not change the tax burden, and in about 5% the tax burden would be lower if the intermediate subsidiary was non-existent. This last 5% is surprising in light of a comprehensive analytical literature on tax-induced holding structures. Obviously, although group structures generally seem to be tax driven, there are non-tax influencing factors which sometimes prevail.

7. Form Follows Function

Table 7-9: Characteristics of groups effectively applying holding structures

	(1)	(2)	(3)	(4)	(5)	(6)
<i>OLS without group-fixed effects</i>						
ln(Fixed Assets)	.012*** (.001)	.020*** (.002)	.021*** (.001)		.021*** (.002)	.020*** (.002)
Counterdist	.009*** (.003)	.010*** (.003)		.011*** (.003)	.010*** (.003)	.010*** (.003)
Group Affiliate Number	-.003*** (.000)		-.001*** (.000)	-.001*** (.000)	-.001 (.001)	-.001*** (.000)
(Group Affiliate Number) ²	.001*** (.000)		.002*** (.000)	.001* (.000)		.001*** (.000)
Group's Fixed Assets		-.065*** (.007)	-.069*** (.007)	-.060*** (.006)	-.035*** (.002)	-.063*** (.007)
(Group's Fixed Assets) ²		.168*** (.034)	.184*** (.033)	.184*** (.030)		.163*** (.031)
Observations	46,368	46,362	47,419	55,987	46,368	46,362
Adjusted R ²	.213	.230	.218	.204	.229	.230
F-test	59.46	90.90	87.35	36.43	88.06	84.01
	(7)	(8)	(9)	(10)	(11)	(12)
<i>OLS with group-fixed effects</i>						
ln(Fixed Assets)	.019*** (.001)	.020*** (.001)	.020*** (.001)		.020*** (.001)	.019*** (.001)
Counterdist	.010*** (.003)	.011*** (.003)		.013*** (.003)	.010*** (.003)	.011*** (.003)
Group Affiliate Number	-.001*** (.000)		-.001** (.000)	-.001*** (.000)	-.001 (.000)	-.001** (.000)
(Group Affiliate Number) ²	.001*** (.000)		.001** (.000)	-.001* (.000)		.001** (.000)
Group's Fixed Assets		-.061*** (.012)	-.058*** (.013)	-.067*** (.011)	-.036*** (.004)	-.059*** (.012)
(Group's Fixed Assets) ²		.129** (.053)	.108* (.057)	.195*** (.042)		.122** (.052)
Observations	46,368	46,362	47,419	55,987	46,368	46,362
Adjusted R ²	.303	.304	.300	.274	.304	.304
F-test	45.53	57.29	50.86	17.75	56.44	51.34

The binary dependent variable is one if the repatriation of profits in the form of dividends from a subsidiary to a company unit two levels above is from a tax point of view cheaper via the existing holding company than without it. Put differently, if the holding brings a tax saving, the dependent variable is one, otherwise it is zero. The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimations in column (7) to (12) include group-fixed effects. *, **, and *** show significance at the level of 10%, 5%, and 1 %.

The regressions of Tables 7-9 and 7-10 build on the information shown in Table 7-8. The binary dependent variable is one if the intermediate subsidiary brings a tax saving, otherwise it is zero. The independent variables aim at revealing which kinds of firms or groups apply such tax-efficient structures. As in the previous tables, the upper part of Tables 7-9 and 7-10 show results from regressions without group-fixed effects, whereas in the lower part, group-fixed effects are included.

7. Form Follows Function

Table 7-10: Characteristics of groups effectively applying holding structures

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Logit estimation</i>						
<i>ln(Fixed Assets)</i>	.072*** (.008)	.116*** (.007)	.117*** (.007)		.120*** (.007)	.117*** (.007)
<i>Counterdist</i>	.061*** (.021)	.068*** (.022)		.068*** (.022)	.067*** (.022)	.067*** (.021)
<i>Group Affiliate Number</i>	-.016*** (.001)		-.002** (.001)	-.004*** (.001)	.001 (.001)	-.002*** (.001)
<i>(Group Affiliate Number)²</i>	.001*** (.000)		.001*** (.000)	.001*** (.000)		.001*** (.000)
<i>Group's Fixed Assets</i>		-.358*** (.038)	-.367*** (.035)	-.322*** (.032)	-.227*** (.013)	-.352*** (.035)
<i>(Group's Fixed Assets)²</i>		.786*** (.182)	.844*** (.175)	.877*** (.159)		.783*** (.171)
Observations	46,368	46,362	47,419	55,987	46,368	46,362
Pseudo R ²	.167	.185	.174	.163	.185	.186
Wald chi ²	697.54	850.96	918.75	460.95	833.70	868.60
Probability > chi ²	.000	.000	.000	.000	.000	.000
	(7)	(8)	(9)	(10)	(11)	(12)
<i>Panel logit estimation</i>						
<i>ln(Fixed Assets)</i>	.147*** (.021)	.254*** (.022)	.240*** (.019)		.261*** (.022)	.253*** (.022)
<i>Counterdist</i>	.466*** (.021)	.474*** (.021)		.496*** (.017)	.473*** (.021)	.474*** (.021)
<i>Group Affiliate Number</i>	-.018*** (.002)		-.003** (.002)	-.006*** (.001)	-.001* (.001)	-.004** (.002)
<i>(Group Affiliate Number)²</i>	.001*** (.000)		.001** (.000)	.001*** (.000)		.001** (.000)
<i>Group's Fixed Assets</i>		-1.08*** (.090)	-.924*** (.080)	-1.09*** (.079)	-.609*** (.026)	-1.04*** (.093)
<i>(Group's Fixed Assets)²</i>		2.60*** (.483)	2.10*** (.426)	3.05*** (.411)		2.48*** (.487)
Observations	46,368	46,362	47,419	55,987	46,368	46,362
Number of Groups	12,096	12,094	12,358	14,601	12,096	12,094
Wald chi ²	4,276.21	4,454.24	4,752.65	5,289.83	4,445.13	4,456.87
Probability > chi ²	.000	.000	.000	.000	.000	.000

The binary dependent variable is one if the repatriation of profits in the form of dividends from a subsidiary to a company unit two levels above is from a tax point of view favorable, i.e. cheaper, via the existing holding company than without it. Put differently, if the holding brings a tax saving, the dependent variable is one, otherwise it is zero. The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimations in column (7) to (12) consider the panel dimension. *, **, and *** show significance at the level of 10%, 5%, and 1 %.

While Table 7-9 is based on ordinary least squares estimations, Table 7-10 shows the results of logit estimations. First of all, given that *ln(Fixed Assets)* shows positive and significant coefficients in all estimations of Table 7-9 and Table 7-10, it is rather big subsidiaries which use holdings above them to redirect profits to upper levels in the group structure such as to the

group's headquarters. This is not surprising, because the bigger subsidiaries can be expected to yield higher profits than smaller entities, and therefore the benefit of tax efficiently redirecting their dividends is high as well.

The coefficient of *Counterdist* is positive and significant in all estimations as well. *Counterdist* is the distance in kilometers between the respective subsidiary and the company unit two levels above it. Therefore, the positive coefficient indicates that remotely located subsidiaries can and do benefit from inserting conduit entities for redirecting their profits. It is rather these remotely located subsidiaries than those in the close vicinity of the upper firm unit which benefit from being held indirectly.

The negative and significant coefficients of *Group Affiliate Number* and *Group's Fixed Assets* seem surprising at first sight because they indicate that efficient tax saving is rather found in smaller groups with little assets. The squared term of both of these variables is, however, positive and significant, which at least indicates that the effect gradually vanishes with growing sizes. Despite appearing counter-intuitive, even the basic effect can be explained: groups with only a few subsidiaries can focus their tax planning and might not need to consider other non-tax determinants such as a concise internal reporting structure. The variables covering the respective group's assets might interact by including the respective subsidiary's fixed assets as well. It has to be mentioned that, as can be seen from Table 7-2, in this dataset the average number of affiliates per group is only about four. This results from the MiDi dataset's observation of subgroups rather than the inclusion of undifferentiated conglomerates.

Based on the 5% of all firms in Table 7-8, which put up with higher taxes on repatriation by inserting an intermediate subsidiary, I concluded that although group structures generally seem to be tax driven, there are non-tax influencing factors which sometimes prevail. These other influence factors determining preferable holding locations are analyzed when tracing Hypothesis H7-5. In tracing this hypothesis in Table 7-11, the number of holding companies per country serves as the dependent variable and country characteristics are independent variables. In other words, I aim at working out which characteristics make a country a preferable holding location. The regression results of Table 7-11 suggest that the existence of a holding regime, the existence of a group taxation rule, and a country's GDP per capita positively influence the decision of where to establish a holding company, whereas a high country risk negatively influences such a decision.

7. Form Follows Function

Table 7-11: Further tax and non-tax factors determining a holding location

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Tax Rate	.200 (.300)	.422 (.290)	.280 (.301)	.320 (.301)	.348 (.300)	.301 (.300)	.324 (.299)	.296 (.301)	.304 (.300)	-.123 (.296)	.331 (.300)	.299 (.301)
Existence of Holding Regime		.346*** (.073)	.322*** (.076)	.330*** (.076)	.308*** (.075)	.330*** (.076)	.322*** (.076)	.319*** (.076)	.317*** (.076)	.319*** (.076)	.339*** (.076)	.317*** (.076)
Existence of Thin Cap Rule	-.099*** (.036)		-.057 (.037)	-.056 (.037)	-.056 (.036)	-.055 (.037)	-.054 (.037)	-.056 (.037)	-.057 (.037)	-.064* (.037)		-.057 (.037)
Existence of Group Tax Regime	.029** (.014)	.027* (.015)		.026* (.015)	.027* (.015)	.026* (.015)	.026* (.015)	.026* (.015)	.026* (.015)	.025* (.015)	.028* (.015)	.026* (.015)
Euro country	.973** (.463)	.707 (.449)	.715 (.449)			.495 (.436)	.798* (.439)	.688 (.459)	.720 (.450)	.981 (.614)	.797* (.461)	.721* (.450)
EU 27 Member	-1.11* (.603)	-.767 (.578)	-.773 (.576)	-.507 (.587)	-.844 (.658)		-.733 (.549)	-.359 (.421)	-.793 (.578)	-.384 (.603)	-.842 (.604)	-.795 (.578)
OECD Member	.609 (.474)	.386 (.450)	.435 (.449)	.611 (.473)	.891* (.493)	.419 (.476)		.722* (.411)	.435 (.450)	-.581 (.501)	.781* (.463)	.436 (.451)
Distance to Germany	-.094 (.067)	-.080 (.063)	-.081 (.063)	-.077 (.067)	-.076 (.079)	-.026 (.050)	-.103* (.053)		-.082 (.063)	-.139** (.056)	-.076 (.066)	-.082 (.063)
(ln)GDP	.101 (.105)	.175* (.102)	.181* (.102)	.188* (.103)		.211** (.099)	.207** (.099)	.158 (.101)		.886*** (.069)	.148 (.106)	.175* (.103)
(ln)GDPperCapita	.941*** (.116)	.934*** (.113)	.924*** (.113)	.923*** (.114)	1.08*** (.071)	.901*** (.111)	.910*** (.114)	.944*** (.111)	.926*** (.113)		1.02*** (.114)	.928*** (.113)
Inflation	.001 (.001)	.053 (.149)	.055 (.147)	.054 (.151)	.055 (.147)	.051 (.148)	.053 (.148)	.055 (.148)		.012 (.017)	.021 (.002)	.053 (.148)
OECD countryrisk	-.175*** (.033)	-.163*** (.033)	-.167*** (.033)	-.167*** (.033)	-.164*** (.033)	-.166*** (.033)	-.171*** (.033)	-.165*** (.033)	-.165*** (.033)	-.182*** (.034)		-.166*** (.033)
Observations	673	673	673	673	673	673	673	673	673	673	673	673
Number of groups	53	53	53	53	53	53	53	53	53	53	53	53
Wald chi ² (23)	1407.31	1431.40	1431.44	1429.40	1429.71	1431.28	1425.22	1434.98	1434.02	1320.76	1401.35	1434.14
Prob > chi2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

The dependent variable is the number of holding companies in a country. The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. Estimation in column (2) includes group fixed effects. *, ** and *** show significance at the level of 10%, 5% and 1 %.

Based on the positive and highly significant coefficients of *Existence of Holding Regimes*, following the results in column (12), the existence of a holding regime in a country increases the number of observed holdings per country and year by 0.317 on average. Table 7-13 in the Appendix shows which countries have prominent specific holding incentives in which years and how these incentives are specified.

The number of counted holdings is higher in countries where a group taxation rule exists. This can be seen from the positive and weakly significant coefficient of *Existence of Group Tax Regime*. Based on the column (12), on average I count .026 more holdings in countries with a group taxation rule compared to countries without it. Thus, the chance to net profits and losses on a national level seems to serve as an argument for establishing a holding in such a country. The effect is, admittedly, rather small in size and only significant at the 10% level.

The GDP per Capita has a positive and significant impact on the number of holdings per country. Additionally, in several regressions shown in Table 7-11, the GDP also shows a positive and significant coefficient. Both variables are applied in logs. The positive coefficients indicate that it is rather countries with well-established markets which serve as holding locations.

Not by surprise, the *OECD country risk variable*, measuring the general investment risk on a country/year basis, shows a strongly significant negative impact on the number of holdings per country. As shown in Table 7-2, the country risk can take values from 0 (low risk) to 7 (high risk). Based on the results in column (12), an increase in the country credit risk by 1 unit lowers the number of observable holdings in this country and year by about .166 on average.

7.5.2 Group Taxation Regimes and Horizontal Structure

Aiming at answering Hypothesis H7-6, I provide an analysis dealing with the impact of group taxation regimes on the structure of national subgroups of multinational firms. A national subgroup includes all incorporated and wholly-owned subsidiaries located in a certain host country and belonging to the same German parent company. I analyze whether the possibility of offsetting profits and losses between affiliated subsidiaries affects the legal structures of the activities in a host country.

First, I analyze the probability that there are several, instead of just one, subsidiaries established by a certain German parent firm in the respective country. As the dependent variable, I consider a binary variable indicating if a German parent company has organized its

activities in a country through more than one subsidiary. If all activities carried out by a group in that respective host country are pooled within one subsidiary, the variable is zero.⁹³

Formally, the decision of parent company j to structure its activities in a host country h in year t across more than one subsidiary is modeled as a discrete choice decision problem and is captured in an econometric model using a standard latent variable framework. Suppose that the observable decision to either use more than one subsidiary, y_{jt} , or to use only one subsidiary is related to the latent predisposition to use more than one subsidiary, y_{jt}^* , according to $y_{jt} = 1[y_{jt}^* > 0]$ where $1[\cdot]$ is the indicator function. Suppose, furthermore, that a parent's predisposition towards using more than one subsidiary per host country is a function of the existence of group taxation and a vector X of firm- and host country-specific characteristics, a common period-specific effect γ_t , an unobservable parent-specific effect c_j , and a residual $\varepsilon_{j,h,t}$. Choosing a linear specification for the latent variable provides me with

$$y_{jt}^* = \beta_1 \text{Grouptaxation}_{h,t} + \mathbf{X}_{jt}\boldsymbol{\beta}_2 + \gamma_t + c_j + \varepsilon_{jht} \quad (7-3)$$

where β_1 and β_2 are the vectors of coefficients to be estimated. I apply a fixed-effects logit model (Chamberlain, 1980) for this estimation. The fixed-effects model assumes that the error $\varepsilon_{j,h,t}$ is distributed symmetrically around zero, with accumulative distribution function G . The binary response model thus takes the form

$$\begin{aligned} P(y_{jt} = 1 | \text{Grouptaxation}_{ht}, \mathbf{X}_{jt}, c_j) &= P(y_{jt}^* | \text{Grouptaxation}_{ht}, \mathbf{X}_{jt}, c_j) \\ &= G(\beta_1 \text{Grouptaxation}_{h,t} + \mathbf{X}_{jt}\boldsymbol{\beta}_2 + \gamma_t + c_j) \end{aligned} \quad (7-4)$$

Secondly, the number of subsidiaries held by a German parent company in one country is supposed to be affected by the existence of a group taxation regime. I estimate a Poisson model to trace this hypothesis. I model the number of subsidiaries n held by a German parent company j in a foreign country h . I am interested in the expected value of n_{jh} conditional on some control variables X_{jh} , where X_{jh} contains, for instance, the country-specific variable indicating if a group taxation regime is applied. One way to express this is to use the exponential function as a functional form. In order to determine the probability of n_{jh} given X_{jh} , I further assume a Poisson distribution orienting by the following probability function:

$$f(n_{jh} | X_{jh}) = \frac{\exp(-\lambda_{jh}) \lambda_{jh}^n}{n!}, \quad n = 1, 2, 3, \dots \quad (7-5)$$

⁹³ Note that I only consider host countries where the respective parent company controls at least one subsidiary.

In order to obtain the Poisson regression model, I use the functional form denoted above for the intensity parameter to construct the loglikelihood function. Subsequently, I can estimate the vector using maximum likelihood methods.

In both the panel logit and the panel Poisson estimation, robustness of the standard errors is achieved by bootstrapping standard errors with 100 repetitions as suggested by Cameron and Trivedi (2009) and Andrews and Buchinsky (2002). A control variable covers the number of industries the parent company operates in. It can be expected that a group which shows business activities in different industries will split up its investments into more subsidiaries.

7.5.3 Regression Results Horizontal Integration

Concerning Hypothesis H7-6, all columns of Tables 7-12a to 7-12c show that the existence of a group taxation regime positively influences the number of subsidiaries observed per country, year, and group. While Table 7-12a shows the results for the OLS regression, Tables 7-12b and 7-12c report the regression results of the panel fixed-effects logit model and the fixed-effects Poisson model. The dependent variable in Tables 7-12a and 7-12b distinguishes whether the group is split up into two or more subsidiaries in a country (1) or not (0). In Table 7-12c, the dependent variable is the number of subsidiaries per country, group, and year. Based on the results of column (12) in Table 7-12c, the existence of a group taxation regime increases the number of observed subsidiaries by .089. The probability of a split up into at least two subsidiaries per country and year increases by 16.1% if a group taxation regime is in place, as can be seen from column (12) in Table 7-12b.

The control variables show the expected signs. The tax rate in the host country has a negative impact on the number of observed subsidiaries per group. A group having a higher variability of different industries establishes more subsidiaries per country. Based on column (12) in Table 7-12c, if a group operates in one more industry, this increases its number of subsidiaries per country by .086. The market size, approximated by the GDP of the host country, has a strong and positive effect on the number of subsidiaries founded there. GDP per capita, which serves as an indicator for both labor cost and the purchasing power in the host country, also shows a positive sign. The country risk control variable shows the expected negative sign and is significant. Since a higher value of this variable represents a higher country risk, the negative sign indicates that the foundation of several instead of just one subsidiary is less likely in riskier countries. This finding suggests that a centralized structure might be assumed to be superior for avoiding fraud and for monitoring business in riskier countries.

7. Form Follows Function

Table 7-12a: Impact of a group taxation regime on group structure sophistication

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>OLS with group fixed effects</i>												
Group Tax Regime	.078*** (.008)	.079*** (.008)	.040*** (.007)	.017** (.007)		.015** (.007)	.014** (.008)	.036*** (.008)	.017*** (.006)	.015** (.007)	.018*** (.007)	.015* (.007)
Industries		.046*** (.002)	.046*** (.002)	.046*** (.002)	.046*** (.002)		.046*** (.002)	.046*** (.002)	.046*** (.002)	.046*** (.002)	.046*** (.002)	.046*** (.002)
Tax Rate					-.206*** (.040)	-.210*** (.041)		.224*** (.053)	-.225 (.043)	-.207*** (.041)	-.191*** (.041)	-.212*** (.041)
(ln)GDP			.041*** (.002)	.038*** (.002)	.045*** (.002)	.044*** (.002)	.038*** (.002)		.044*** (.002)	.044*** (.002)	.044*** (.002)	.044*** (.002)
(ln)GDPperCapita				.034*** (.004)	.024*** (.005)	.023*** (.005)	.025*** (.006)	.028*** (.008)		.022*** (.005)	.033 (.004)	.023*** (.005)
Inflation					-.001 (.005)	-.001 (.006)	-.007 (.008)	-.020* (.012)	.003 (.004)		-.012 (.012)	-.000 (.006)
OECD countryrisk					-.011*** (.003)	-.009*** (.003)	-.007*** (.003)	-.010** (.004)	-.020*** (.002)	-.010*** (.003)		-.010*** (.003)
Observations	152,125	152,125	152,125	152,125	152,125	152,125	152,125	152,125	152,125	152,125	152,125	152,125
Adjusted R ²	.278	.285	.300	.302	.302	.295	.302	.292	.302	.303	.302	0.303
F-test	8.41	32.53	63.96	66.86	73.36	63.52	65.53	34.55	73.62	75.67	68.86	73,58
Groups	10,417	10,417	10,417	10,417	10,417	10,417	10,417	10,417	10,417	10,417	10,417	10,417
Observations per Group	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60

The dependent variable is the number of subsidiaries per group and country. The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. All of the estimations include group fixed effects. *, ** and *** show significance at the level of 10%, 5% and 1 %.

7. Form Follows Function

Table 7-12b: Impact of a group taxation regime on group structure sophistication

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>XTLOGIT estimation</i>											
Group Tax Regime	.648*** (.042)	.657*** (.046)	.182*** (.052)	.162*** (.052)		.156*** (.051)	.162*** (.051)	.324*** (.056)	.182*** (.047)	.160*** (.056)	.189*** (.051)	.161*** (.051)
Industries		.261*** (.026)	.274*** (.029)	.274*** (.028)	.273*** (.026)		.274*** (.026)	.267*** (.029)	.274*** (.024)	.274*** (.028)	.273*** (.031)	.274*** (.028)
Tax Rate					-1.96*** (.336)	-1.98*** (.342)		1.88*** (.324)	2.14*** (.399)	-1.98*** (.362)	-1.81*** (.345)	2.010*** (.366)
(ln)GDP			.316*** (.021)	.313*** (.023)	.380*** (.020)	.365*** (.018)	.312*** (.018)		.374*** (.024)	.370*** (.023)	.368*** (.024)	.371*** (.023)
(ln)GDPperCapita			.308*** (.032)	.231*** (.037)	.215*** (.039)	.204*** (.040)	.229*** (.047)	.253*** (.046)		.203*** (.039)	.291*** (.031)	.206*** (.042)
Inflation				-.323 (.292)	-.092*** (.024)	-.001 (.002)	-.003 (.003)	-.005 (.003)	-.056 (.137)		-.005 (.003)	-.002 (.003)
OECD countryrisk				-.056** (.024)	-.099*** (.024)	-.079*** (.342)	-.056** (.027)	-.072*** (.027)	-.186*** (.021)	-.085*** (.024)		-.082*** (.025)
Observations	94,042	94,042	94,042	94,042	94,042	94,042	94,042	94,042	94,042	94,042	94,042	94,042
Groups	2,614	2,614	2,614	2,614	2,614	2,614	2,614	2,614	2,614	2,614	2,614	2,614
Observations per Group	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9

The dependent variable is if a group has only one subsidiary per country (0) or at least two (1). The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. *, ** and *** show significance at the level of 10%, 5% and 1 %.

7. Form Follows Function

Table 7-12c: Impact of a group taxation regime on group structure sophistication

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>XTPoisson estimation</i>											
Group Tax Regime	.284*** (.039)	.284*** (.037)	.091*** (.018)	.090*** (.019)		.089*** (.020)	.090*** (.020)	.164*** (.024)	.098*** (.020)	.090*** (.020)	.093*** (.012)	.089*** (.019)
Industries		.085*** (.007)	.086*** (.008)	.086*** (.007)	.085*** (.008)		.086*** (.007)	.085*** (.007)	.086*** (.007)	.086*** (.007)	.086*** (.007)	.086*** (.007)
Tax Rate					-.553*** (.123)	-.552*** (.129)		1.17*** (.205)	-.613*** (.146)	-.534*** (.140)	-.527*** (.125)	-.548*** (.138)
(ln)GDP			.146*** (.018)	.146*** (.019)	.168*** (.021)	.161*** (.022)	.146*** -20		.164*** (.022)	.161*** (.023)	.161*** (.022)	.162*** (.023)
(ln)GDPperCapita			.090*** (.012)	.088*** (.017)	.088*** (.016)	.081*** (.016)	.088*** (.016)	.107*** (.020)		.082*** (.016)	.092*** (.012)	.081*** (.017)
Inflation				.045*** (.018)	.073*** (.022)	.062*** (.020)	.045** (.020)	-.013 (.017)	.076*** (.021)		.052*** (.020)	.001*** (.000)
OECD countryrisk				-.004 (.007)	-.019*** (.007)	-.009 (.007)	-.003 (.007)	-.007 (.007)	-.050*** (.007)	-.007 (.008)		-.009 (.007)
Observations	150,878	150,878	150,878	150,878	150,878	150,878	150,878	150,878	150,878	150,878	150,878	150,878
Groups	9,170	9,170	9,170	9,170	9,170	9,170	9,170	9,170	9,170	9,170	9,170	9,170
Observations per Group	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5

The dependent variable is if a group has only one subsidiary per country (0) or at least two (1). The standard errors shown in parentheses are robust and clustered on the country/year level. Year dummies for 1996-2008 are included but not reported. *, ** and *** show significance at the level of 10%, 5% and 1 %.

7.6 Concluding Remarks

I have provided evidence on the group structures of multinationals and I have analyzed to what extent these structures are tax-efficient. Based on the full identification of group structures, I have identified that while most indirectly held companies are held by only one holding level, several group structures are more sophisticated comprising up to seven layers. The presentation of holding countries in dependence of the subsidiaries' locations shows which countries serve as popular hosts.

My regression results carefully indicate that the establishment of holding structures is generally carried out in line with tax saving strategies. If the withholding tax on dividends between the country of a subsidiary and the country of its superior foreign unit is low, this subsidiary tends to be held directly instead of via a holding. Put differently, holdings are generally established at positions of the group structure where they can at least potentially cause savings in withholding taxes. Furthermore, operative subsidiaries tend to be held via subsidiaries located in countries with low withholding taxes towards the country of the superior foreign-based company unit. It is active operative subsidiaries also carrying out holding functions rather than pure holding subsidiaries which are applied for tax structuring. Despite this general evidence on tax-efficient group structuring, the actual tax savings by multinational holding structures appear rather small. On average they only lead to a total tax burden reduction of about 2 percentage points as compared to the burden if the holding was non-existent. This result is surprising in light of a comprehensive analytical literature on tax-induced holding structures. Therefore, I identified additional determinants of a preferable holding location given the location of a subsidiary, such as the existence of a specific holding regime. Concerning the tax impact on the horizontal group structure, I provide evidence that the existence of a group taxation regime leads to a wider spread of investments.

Taxes do matter for the company structure, but given other influencing factors and especially given the need for hierarchical clarity, the influence of taxes has limits. "Form follows function" holds, but my paper made it clear that the function goes beyond saving withholding taxes or netting profits and losses. Multinationals aim at saving taxes by holding structures, but in the setup of their business structure, they remain – maybe irrationally – sovereign. In weighing tax benefits and a clear and manageable group structure, the directors of multinationals might reconsider the credo of Sullivan (1906): "As you are, so are your buildings and as are your buildings, so are you."

7.7 Appendix

Methods to Avoid Double Taxation and Repatriation Taxes

If the exemption method is applied, repatriated intercompany dividends are tax-exempt at the level of the firm receiving the dividends. However, in a few countries like France, Germany or Belgium, a share α is still subject to tax, whereas in most countries applying the exemption method, $\alpha = 0$. Then, the tax m imposed on one euro of intercompany dividends amounts to:

$$(7-6) \quad m = \alpha \tau^R + \omega^S$$

Where τ^R is the corporate tax rate of the residence country and ω^S is the withholding tax rate imposed on intercompany dividends by the source country.

In the case of a credit system, intercompany dividends are subject to tax but taxes paid abroad reduce the tax liability. If a direct credit is applied, the foreign tax credit includes the withholding taxes imposed on intercompany dividends. Then, the additional tax imposed on one dollar of intercompany dividend amounts to:

$$(7-7) \quad m = \tau^R - \min\{\tau^R; \omega^S\} + \omega^S$$

An indirect credit also includes foreign corporate taxes τ^S paid by the subsidiary. The additional tax imposed on intercompany dividends is computed in accordance with the following expression:

$$(7-8) \quad m = \frac{\tau^R}{(1-\tau^S)} - \min\left\{\frac{\tau^R}{(1-\tau^S)}; \frac{\tau^S}{(1-\tau^S)} + \omega^S\right\} + \omega^S$$

Expressions (7-7) and (7-8) show that the repatriation tax is determined by the tax rate of the residence country. It can be deducted from the formulas that there is a conceivable situation where a decrease in the withholding tax ω^S is just subsidized by a proportional increase in τ^R . This is the case if the tax rate of the residence country exceeds the tax credit. Then, a reduction of withholding tax, e.g. caused by a new tax treaty, has no material effect.

7. Form Follows Function

Table 7-13: Specific holding regimes and comparable tax incentives

Country	Years	Explanation
Austria	2005-2008	Pooling of the profits of companies is available through establishing companies as consolidated enterprises, i.e. through financial, economic or operational control. From 2005 on, this is also possible in cross-border cases.
Bermuda	All	Examples of exempted companies include investment holding companies, insurance companies, and foreign sales corporations. Applications that taxes introduced in Bermuda do not apply to such companies are possible until 28 March 2016 and are usually granted.
Bulgaria	All	Although repealed in 1993, the following incentives were still available to companies who had been granted them before the abolishment. Subsidiaries of foreign companies as well as companies with more than 49% foreign participation and capital investment of more than 100.000 USD are exempt from corporate income tax if investing in high technology or the agriculture and food industry.
	1996-2001	A company with foreign participation of at least 50% which was acquired before 2000 and shows invested capital of at least 5.000.000 USD can enjoy a tax holiday of 5 years given it invests 50% of what would have been taxes in fixed assets. This is granted till end of 2001.
Chile	2004-2008	Under the Chilean Holding Company (CHC) regime, a participation exemption is granted with respect to income earned, dividend distributions, and capital gains. In effect, foreign investors using the CHC to channel foreign investments into Chile are not subject to income tax in Chile with respect to investments held by the CHC outside of Chile (that is on income earned on their participations, on distributions of the income, and on capital gains earned on disposals of their investments).
Ireland	All	Extensive incentives for international financial services centers are granted. These are, among others, an exemption from local property tax for 10 years, an exemption from capital gains tax as well as generous depreciation allowances.
Liechtenstein	All	Holding companies are exempt from income tax. They are, however, subject to capital tax, but only at a reduced rate.
Luxembourg	All	Holding companies under the law of July 31, 1929 ("1929 holding companies") are not subject to corporate income tax. As the regime violates state aid rules, no new such holdings were granted after January 1, 2007. Those holdings which already had the status before that date, however, benefit from it through 31 December 2010.
Netherlands	All	Foreign losses can be used in financial holdings. Moreover, a tax free reserve of up to 80% of the financial service income can be accumulated in the financial holding.
Singapore	All	The "enhanced headquarters incentive package" enables headquarters of all types to be taxed at rates of only 5%, 10% or 15% instead of the regular rates.
Switzerland	All	A holding company is regularly almost completely exempt from the cantonal part (but not from the federal part) of the income tax. The normal profit tax only applies to immovable property located in Switzerland.

The source of this information is the IBFD European and Global Tax Handbooks as well as tax guides by the big four audit and tax companies. The reference "All" in the column "years" means, that the regime was in place throughout 1996-2008.

7. Form Follows Function

Table 7-14: Withholding tax rates on dividends in 2008

[illegible]

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

7. Form Follows Function

Table 7-15: Methods of dealing with incoming dividends in 2008

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Austria	AUT	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO							
Belgium	BEL	DC	EX	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO								
Bermuda	BMU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Brazil	BRA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO							
Bulgaria	BGR	DC	EX	.95	DO	IC	EX	DO	IC	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO							
Canada	CAN	DC	EX	.95	DO	IC	EX	DO	IC	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO							
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC	IC	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	DC	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	EX	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	DE	EX	EX	DC	DE	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO					
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Latvia	LVA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Lithuania	LTU	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	EX	IC	DC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	IC	EX	EX	IC	IC	DO					
Malta	MLT	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX																																	

Table 7-16: Method of group taxation

Country	1996	Method in 1996	Change	to	2008
Australia	yes	Group Contribution	2002	Consolidation	yes
Austria	yes	Fiscal Unity			yes
Belgium	no				no
Brazil	no				no
Bulgaria	no				no
Canada	no				no
China	no				no
Cyprus	no		2003	Group Relief	yes
Czech Republic	no				no
Denmark	yes	Consolidation			yes
Estonia	no				no
Finland	yes	Group Contribution			yes
France	yes	Fiscal Unity			yes
Greece	no				no
Hungary	no				no
Iceland	no		1999	Consolidation	yes
India	no				no
Ireland	yes	Group Relief			yes
Italy	yes	TaxCredit Exchange	2000	Group Contribution	
			2004	Consolidation	yes
Japan	no		2003	Consolidation	yes
Latvia	no		1998	Group Relief	yes
Lithuania	no		2004	Group Contribution	yes
Luxembourg	yes	Fiscal Unity			yes
Malta	yes	Group Relief			yes
Mexico	yes	Consolidation			yes
Netherlands	yes	Consolidation			yes
New Zealand	yes	Group Relief			yes
Norway	yes	Group Contribution			yes
Poland	no		1997	Fiscal Unity	yes
Portugal	yes	Consolidation			yes
Romania	no				no
Russian Federation	no				no
Slovak Republic	no				no
Slovenia	yes	Consolidation	2007	no	no
South Korea	no				no
Spain	yes	Consolidation			yes
Sweden	yes	Group Contribution			yes
Switzerland	no				no
Turkey	no				no
United Kingdom	yes	Group Relief			yes
USA	yes	Consolidation			yes

In a consolidation or fiscal unity system, the financial statements of companies belonging to the same group are either made up together or merged at the end of the fiscal year. When there is a system of group contribution, the profitable subsidiary is enabled to contribute a part or all of its profits to the subsidiary which suffered a loss. Correspondingly, losses are transferred among subsidiaries in a group relief system. In effect, all of these systems enable the netting of profits and losses of different tax subjects. Therefore, I apply a dummy variable indicating if group taxation is available.

7.8 References

- Altshuler, R. and H. Grubert (2003): Repatriation taxes, repatriation strategies and multinational financial policy, *Journal of Public Economics* 87, 73-107.
- Andrews, D. and M. Buchinsky (2002): On the number of bootstrap repetitions for BC_a confidence intervals, *Econometric Theory* 18, 962-984.
- Becker, J. and C. Fuest (2007): Why is there corporate taxation? The role of limited liability revisited, *Journal of Economics* 92, 1-10.
- Cameron, C.A. and P.K. Trivedi (2009): *Microeconometrics using Stata*, Texas.
- De Mooij, R.A. and S. Ederveen (2003): Taxation and foreign direct investment: a synthesis of empirical research, *International Tax and Public Finance* 10, 673-693.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2006a): Do tax havens divert economic activity?, *Economics Letters* 90, 219-224.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2006b): The demand for tax haven operations, *Journal of Public Economics* 90, 513-531.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2002): *Chains of ownership, regional tax competition and foreign direct investment*, NBER working paper, Cambridge MA.
- Dharmapala, D. and J.R. Hines Jr. (2009): Which countries become tax havens?, *Journal of Public Economics* 93, 1058-1068.
- Dickescheid, T. (2004): Exemption vs. credit method in international double taxation treaties, *International Tax and Public Finance* 11, 721-739.
- Feld, L. und J.H. Heckemeyer (2011): FDI and Taxation – A Meta Study, *Journal of Economic Surveys* 25, 233-272.
- Hines, J.R. Jr. (1994): Credit and deferral as international investment incentives, *Journal of Public Economics* 55, 323-347.
- Hines, J.R. Jr. and E.M. Rice (1994): Fiscal paradise: foreign tax havens and American business, *Quarterly Journal of Economics* 109, 149–182.
- Janeba, E. (1995): Corporate income tax competition, double taxation treaties, and foreign direct investment, *Journal of Public Economics* 56, 311-325.
- Lipponer, A. (2008): *Microdatabase direct investment – a brief guide*, Frankfurt.
- Mintz, J. (2004): Conduit entities: implications of indirect tax-efficient financing structures for real investment, *International Tax and Public Finance* 11, 419-434.
- Mintz, J. and A. Weichenrieder (2010): *The indirect side of direct investment – multinational company finance and taxation*, Cambridge, MA.
- Mintz, J. and H. Tulkens (1996): Optimality properties of alternative systems of taxation of foreign capital income, *Journal of Public Economics* 60, 373-401.
- Sullivan L.H. (1906): *What is Architecture? A Study in the American People of Today*, published in: *The Public Papers* (1988), 174-195.
- Sullivan L.H. (1896): The Tall Office Building Artistically Considered, *Lippincott's Magazine* 57, 403-09, republished in 1905 as: Form and Function Artistically Considered, *The Craftsman* 8, 453-58.
- Winkelmann, R. (2008): *Econometric analysis of count data*, Berlin and Heidelberg.
- Winkelmann, R. (2009): *Analysis of microdata*, Berlin and Heidelberg.

7.9 Survey 5: Empirical evidence on the tax impact on structuring and location decisions

Survey ⁹⁴	Data	Methodology	Results
Altshuler, Grubert (2002)	1996 corporate tax files compiled by the Statistics of Income Division of the IRS. This data set is based on the basic corporate tax form (Form 1120), the form used to claim a foreign tax credit (Form 1118), and Form 5471 which reports on the activities of each CFC of a US parent company. The regressions use 5,981 observations.	Focus on investment-repatriation strategies and the empirical validation of a sophisticated model. In this model, the subsidiary located in the low-tax country can either repatriate taxable dividends to the parent or invest in its own real operations. This investment can be targeted to passive assets the parent can borrow against, or at related affiliates.	The availability of alternative strategies, as described in the 'methodology' section, can affect real investment throughout the worldwide corporation. This particularly refers to the strategies using related affiliates.
Buettner, Ruf (2007)	Outbound side of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The observations cover subsidiaries in 18 host countries during the years 1996 till 2003.	The identification measure is the international variance in statutory tax rates and in effective average tax rates.	An increase in the statutory tax rate significantly reduces the probability that a multinational opts for this location when making its investment decision. The effective average tax rate only serves as a reliable predictor of location decisions if it stresses the statutory tax rate.
Buettner, Wamser (2009)	Observations of foreign subsidiaries in 18 host countries during the years 1996 till 2003. Outbound side of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank.	The identification measure is the international variance in statutory tax rates. Furthermore, the differences in depreciation allowances and in several other kinds of taxes besides profit taxes are utilized for identification.	An increase in the statutory tax rate significantly reduces the probability that a multinational opts for this location when making investment decisions. Depreciation rules and taxes other than profit taxes do not seem to have a significant influence on multinational groups' location decisions.
Desai, Foley and Hines Jr. (2002)	Annual survey of U.S. FDI by the Bureau of Economic Analysis, covering the years 1982 through 1997. Regressions are based on between 20,346 and 185,813 firm observations.	Analysis of the role of chains of ownership for U.S.-based firms operating abroad. While other elements of the paper such as the tax impact on FDI are traced in regressions, the analysis of ownership chains remains foremost descriptive.	Some 30% of aggregate foreign assets were held indirectly via some kind of holding company. Furthermore, the concentration of ownership chains is particularly high in Europe.

⁹⁴ Some of the methodologies' and results' summaries quote the respective papers literally.

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Desai, Foley, Hines Jr. (2006a)	Direct reference to Desai, Foley, Hines Jr. (2006b), where the data source is properly described. Panel of data on the financial and operating characteristics of U.S. firms operating abroad. It is provided by the Bureau of Economic Analysis annual survey of U.S. direct investment abroad and it covers the years 1982 through 1999.	More current evidence on the question if multinationals' activity in tax havens diverts activity from non-havens. An instrumental variables approach is described, which applies the economic growth rate of investment countries as the instrument for a firm's level of foreign direct investment in a non-tax haven country. Instead of presenting the outcome directly, the authors refer to the tables in Desai, Foley, Hines Jr. (2006b).	International firms with leeway regarding their transfer prices are most likely to use tax havens. Tax haven countries seem to fulfill two tasks: allocating taxable income away from the high-tax jurisdiction and facilitating deferral of foreign income in the credit country. The evidence suggests that tax haven activity does not divert but even enhances activity in nearby non-havens.
Desai, Foley, Hines Jr. (2006b)	Bureau of Economic Analysis annual survey of U.S. direct investment abroad covering the years 1982 through 1999. Affiliate-level panel provides financial and operating firm characteristics. The regressions are based on up to 137,895 firm observations.	Analysis of what types of firms establish tax haven operations, and what purposes these operations serve. Extensive descriptive statistics on the amount and spread of tax haven affiliates, using three different tax haven lists. Dependent variables, applied one by one: dummy of whether a parent owns an affiliate in a haven; the ratio of affiliates in havens to all affiliates, ratio of affiliate sales in havens to sales from all the parent's affiliates, and growth rate of sales. IV approach using the average foreign GDP growth rates, calculated using firm-specific weights as the instrument for changes in firm activity outside of tax havens.	Larger, more international firms, and those with extensive intra-firm trade and high research and development intensities are the most likely to use tax havens. The primary use of affiliates in larger tax haven countries is to reallocate taxable income, whereas the primary use of affiliates in smaller tax haven countries is to facilitate deferral of U.S. taxation of foreign income. One percent greater sales and investment growth in nearby non-haven countries is associated with a 1.5 to 2% greater likelihood of establishing a tax haven operation.
Faccio, Lang (2002)	Ownership dataset covering the ultimate ownership and control of 5,232 corporations in 13 Western European countries. Using Worldscope as the starting point, the data is enriched by exclusively gathered information provided	Broad and very informative descriptive analysis of ownership structures, presenting exemplary groups, ultimate ownership patterns by concentration of control, by listing and by internationalization and an additional analysis of dual class shares and their implications. There are no regressions.	Typically, European firms are widely held (36.93%) or family controlled (44.29%). Widely held firms are more important in the UK and Ireland, whereas family controlled firms are so in continental Europe. Financial and large firms are more likely widely held, while non-financial and small firms are more likely

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	by Bolsa de Valores de Lisboa, Commerzbank, Helsinki Media Blue Book, Hugin, the Union Bank of Switzerland, and by the Vienna Stock Exchange.		family controlled.
Gomes-Casseres (1989)	Data from over 1,500 manufacturing subsidiaries of 180 U.S. multinationals. Dataset builds on Harvard's Multinational Enterprise Project which, over a period of ten years, gathered detailed data on almost 20,000 subsidiaries of the 187 largest U.S. MNEs. It is supplemented by information from the PIMS database and from World Bank statistics.	Search for answers to the question how multinational enterprises select ownership structures for their foreign manufacturing subsidiaries. Taxes as a potential driver are not the main focus. Dependent binary variable: whether an individual MNE subsidiary was organized as a jointly or a wholly-owned venture or not. Independent variables either measure the subsidiary's business or the relative capabilities of the multinational's parent. Logit estimation approach.	Multinationals are found to prefer a joint venture with a host-country firm over a wholly-owned subsidiary when: (1) the capabilities of the local firm complement their own, (2) the contributions of both firms are costlier to transfer contractually than through ownership channels, and (3) costs due to shirking by partners and conflicts between them do not outweigh the benefits of joint ownership.
Grubert, Slemrod (1998)	US American firm-level observations using tax data provided by the Internal Revenue Service. Cross-section focusing on the year 1987.	The international sector-specific variation of effective average tax rates is used for identification. Furthermore, the paper distinguishes by the sector-specific share of internal transactions and the group's expenditure in research and development.	A higher volume of internal group transactions and of the parent's research and development expenditures increases the probability that a US group has at least one subsidiary in a low-tax country.
Hines, Rice (1994)	Data from the US Department of Commerce's comprehensive benchmark survey of US foreign direct investment for the year 1982. The bundling of firm information to country cells shrinks the regression samples in some cases from 82 to 58 countries.	Insight into the role of tax havens serving as holding countries for U.S. multinationals. Broad descriptive statistics presenting tax haven lists, tax rates, and the spread of tax haven affiliates. OLS estimations and regressions following IV approaches are presented in a parallel manner. Dependent variable is log of net pre-tax non-financial income.	Tax haven locations played a paramount role in the late 1980s, accounting for more than a quarter of U.S. foreign investment and nearly a third of U.S. profits. Based on the behavior of US firms in 1982, it appears that US firms report extraordinarily high profit rates on both their real and their financial investments in tax havens. The calculated tax rate that maximizes tax revenue for a typical haven is about 6%.

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Hubert, Pain (2002)	Panel data set on outward investment by German multinationals to the European Economic Area in the years 1980 till 1996 in seven industries and eight host economies.	Analysis of the structural change in the industrial and geographical FDI patterns in Europe. Specifically, the influences of national governments on location decisions by means of corporate taxes, infrastructure investment, grants and subsidies are worked out. Ample descriptive graphs and statistics, followed by OLS estimations.	Generally mixed evidence. Tax competitiveness appears to be important but is sensitive to the model specification. The government's infrastructure investments attract private firm investment. Fiscal policies seem to have a permanent influence on the location of economic activities.
Masulis, Pham, Zein (2011)	Dataset of 3,007 family group firms drawn from 28,635 listed firms across 45 countries for the years 2003 till 2006. The compiled dataset combines the Osiris database by Bureau Van Dijk and the Worldscope database by Thomson Reuters.	Analysis of family-controlled businesses' motivations regarding financing, control structures and organizational choice. Country-level descriptive statistics on family business groups. Multivariate OLS regression analyses on the prevalence of family business groups, on the structuring of family business groups, on the impact of firm characteristics and group organization choices, and on family group membership's impact on firm performance.	Particular group structures emerge not only to perpetuate control, but also to alleviate financing constraints at the country and firm levels. Family groups are more prevalent in markets with limited availability of capital. At the firm level, investment intensity is greater for firms held in pyramidal rather than in horizontal structures, reflecting the financing advantages of the former. Within a pyramid, internal equity funding, investment intensity, and firm value all increase down the ownership chain.
Mintz (2004)	Foreign direct investment inflows and outflows of ten countries for the years 1997–2001, as provided by the International Monetary Fund. The paper is mainly analytical with data only provided to illustrate and support the model considerations.	Focus on the holdings' function as financing hubs. Multinationals are supposed to use these conduit entities for means of indirect debt financing instead of directly providing the loans to operative subsidiaries. Indirect financing structures by means of conduit entities provide an opportunity to achieve at least two deductions for interest expenses for an investment made in the host country.	So-called conduit countries can be identified by their large amounts of both capital inflows and capital outflows. The paper provides a concise model and some descriptive indications, but abstains from empirical evidence on a micro level. Due to the tax benefits of indirect participations, particular cross-border investments may be substantially favored over purely domestic investment.

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Mintz, Weichenrieder (2010a)	Outbound side of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. Firm-level information covering the years 1989 till 2001. The regressions are based on up to 19,417 observations.	Analysis of the role of holding companies and conduit entities in German inbound and outbound FDI. Identification of the relevant conduit countries acting as stepping stones. Several tax and non-tax factors for the setup of indirect structures are empirically identified. Very detailed and informative descriptive graphs and statistics, followed by logit regressions.	Withholding taxes, credit systems in capital exporting countries, and the possibility of group consolidation are shown to be empirically important for the design of ownership chains in foreign direct investment.
Mintz, Weichenrieder (2010b)	Firm-level information covering the years 1989 till 2001 and stemming from the outbound side of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank.	The book provides a comprehensive analysis of investment structures' determinants. Building on insights from previous working papers, it particularly focuses on indirect financing structures and on the role of holding companies in ownership chains.	While the importance of investors who take advantage of stepping stones in a third country seems on the rise, direct financing arrangements that use a simple structure still form the majority of cases. Withholding taxes as well as conduit entities seem to play an important role for ownership chains.
Morck (2003)	Country-level information, presenting dividend treatment regulations on 33 countries. Structure information on selected prominent groups stem from the Directory of Intercorporate Ownership, Statistics Canada, 1997, as well as from other sources.	Descriptive statistics and illustrative real world examples by group structure outlines. There are no regressions.	Arguments for eliminating the double taxation of dividends apply only to dividends paid by corporations to individuals. Evaluation of US tax reform proposals not distinguishing dividends paid to individuals from inter-corporate dividends. By eliminating double taxation on both sorts of dividends, this might enable pyramidal groups in the US again for the first time since the 1930s.
Mutti, Grubert (2004)	US American subsidiary observations in 60 host countries. Cross-section analysis based on the year 1996.	The analysis builds on the international variation of effective average tax rates and on sector-specific differences in the export intensity.	A tax-induced increase in the cost of capital by one percent lowers the probability of having a subsidiary at this respective location by 0.16%. This impact is even more pronounced concerning multinationals operating in export-oriented sectors.

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Overesch, Wamser (2009)	Outbound side of the Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The firm observations stem from 30 European countries during the period 1989 to 2005.	Analysis whether different types of FDI are asymmetrically affected by corporate taxation. Investment projects are classified according to several characteristics such as the general motivation for FDI, the type of business activity, or the degree of internationalization of the multinational. Count data model with the number of German outbound investments in European countries serving as the dependent variable.	Vertically-integrated investments are more sensitive to host-country taxation than horizontal FDI; larger tax rate elasticities are estimated if business activities are considered highly mobile; in accordance with profit-shifting arguments, subsidiaries of more internationalized companies are less tax responsive to host taxation.
Swenson (1994)	US-based affiliates belonging to foreign multinational groups headquartered in 46 different countries. The firm-level observations cover the years 1984 till 1994.	The analysis uses the variation of business taxes across US federal states. Furthermore, it builds on the different tax systems in the investors' home countries. There is also a differentiation across different types of investments.	A one percentage point increase in a country's tax rate leads to a reduction of multinational subsidiaries located in this country by 0.108%. New foundations decline by 0.11%, additional investments decline by 0.069%, and M&A increase by 0.065%.
Wamser (2008)	Microdatabase Direct Investment (MiDi) provided by the German Federal Bank. The regressions are based on up to 14,487 panel firm observations from the period 1996 to 2005.	Identification of influence factors on multinationals' decision of whether to pursue a direct or an indirect investment strategy. Indirect investment strategies involve at least three corporate entities and enable enhanced opportunities for international tax planning. A switching regression approach takes account of the structural choice's endogeneity.	An increase in the cost of capital reduces indirect investments more than direct effects. Conduit structures enable income to be transferred to the German parent without tax deductions, implying that multinationals actually exploit indirect investment structures to avoid taxes.
Almeida, Park, Subrahmanyam, Wolfenzon (2011)	Ownership data stemming from the Korean Fair Trade Commission. The first panel consists of 1,085 firm observations of 47 groups observed in years between 1998 and 2004. The second panel applied in the paper uses	Analysis of the evolution of Korean chaebols (business groups) using ownership data. There is either vertical growth (as pyramids) or horizontal growth (through direct ownership). The tax impact on the group structure evolution is only a side aspect in this study. OLS regressions with the stand-alone profitability,	The main contribution of this paper is to shed new light on the process through which groups form. Ownership structure is not given exogenously. The evidence is consistent with the selection of firms into different group positions and ascribes the underperformance of pyramidal firms to a

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	2,643 observations.	dividend measures, Tobin's Q and acquisition intensity serving one by one as the dependent variable. Industry-, group- and year-fixed effects are applied.	selection effect rather than tunneling.
Hoshi, Kashyap, Scharfstein (1991)	Panel data set of Japanese manufacturing firms, gathered from the Nikkei Financial Data tapes. The regressions are based on samples of up to 297 firm observations covering the fiscal years 1977-1982.	Comparison of the investment behavior between two sets of Japanese firms: one set has close financial ties to large Japanese banks serving as a primary source of external finance, and are more likely to be well-informed about the firm. The second set of firms has weaker links to a main bank and presumably faces greater problems raising capital. Taxes are only one of the analyzed influencing factors.	The evidence suggests that information and incentive problems in the capital market affect investment structures. Investment is more sensitive to liquidity for the set of firms without close ties to a bank than for the first set. Capital-market imperfections contribute to excessive output fluctuations. In this view, high current profits increase current liquidity, thereby generating investment and increasing future output and profitability.
La Porta, Lopez-de-Silanes, Shleifer (1999)	Data on ownership structures of large corporations in 27 wealthy economies to identify the ultimate controlling shareholders of these firms. One sample consists of the top 20 firms ranked by market capitalization of common equity at the end of 1995. Another sample collects smaller firms, however still requiring common equity of at least \$500 million at the end of 1995.	Ownership structures of prominent firms such as Microsoft, Barrick Gold, Hutchison Whampoa, Toyota Motor, Samsung Electronics, Daimler Benz AG, ABB AG, Fiat SPA, and Electrolabel SA are shown in the first part of the descriptive section. This is followed by broad and informative mean and median value reports of structure drivers. There are no regressions.	Except in economies with very good shareholder protection, relatively few firms seem to be widely held. Firms are typically controlled by families or the State. Equity control by financial institutions is far less common. The controlling shareholders typically have power over firms significantly in excess of their cash flow rights, primarily through the use of pyramids and participation in management.

8. Summary of Results

Essay #1: The Impact of Corporate Taxes on Investment

1. Corporate taxes have a negative effect on investment. A 10 percentage point increased (reduced) corporate tax rate causes a 5.32 percent reduction (increase) in investment, measured by fixed assets.
2. Companies with an existing loss carryforward are less concerned with tax rates in their investment decisions. About half of the negative tax rate effect is compensated for firms with an existing loss carryforward. If the pure tax rate effect is -0.553 and the interaction term of an existing loss carryforward and the tax rate is 0.299, the summated effect is merely -0.254. A tax rate increase of one percentage point therefore only leads to a reduction in investment of 0.254%.
3. Especially holding companies are set up by multinational corporations in tax-favorable destinations in order for investments to be able to be structured tax-optimally. A decrease of ten percentage points in a country's corporate tax rate causes an increase in the share of holding companies in all subsidiaries in that location by 0.55%. The effect is even stronger regarding withholding taxes. A ten percentage point decrease in withholding taxes causes an increase of 0.80% of holding companies relative to all kinds of subsidiaries.

Essay #2: Investment Impact of Tax Loss Treatment

4. There are significant effects of the inter-temporal loss offset provision when paying particular attention to the probability of making losses. A limitation of the maximum loss carryforward to five or less years has a detrimental effect on investments of a subsidiary which faces a high loss probability.
5. As far as *existing* loss carryforwards are concerned, there is a direct effect on investment. Due to liquidity and signaling effects, lower investment occurs in the presence of a loss carryforward.

8. Summary of Results

6. *Existing* loss carryforwards also cause a reduced tax elasticity of investment for companies actually shielded by existing losses. Thus, the negative impact of a high corporate tax rate is lowered if a firm has a loss carryforward. The point estimator for the tax rate of 0.614 and the point estimator for the interaction term between the tax rate and the dummy indicating an existing loss carryforward is 0.305. This means that the presence of losses absorbs about half of the negative tax rate effect.

Essay #3: Empirical Evaluation of Interest Barrier Effects

7. The new German interest barrier made firms lower their debt to assets ratios and their net interest payments. Opposing the original intention, it seems to be national rather than multinational firms which adjusted their capital structure, and it is external rather than internal debt which is reduced. So, at large, the interest barrier does indeed affect financing decisions, but predominantly not in the intended way and not the intended firms.
8. Highly-leveraged firms reduce their internal debt to assets ratios. This reaction can, however, only be reliably identified for national firms. It is unclear if, at least, the most likely targeted multinationals were influenced by the new interest barrier in the intended way.
9. Firms which are likely to be subject to the interest barrier because they have very low profitability tackle the threat of non-deductible interest by relatively reducing their debt to assets ratios. This interest barrier effect, however, is overcompensated by such firms' basic need for debt financing to keep their business running. Therefore, in total, low profitability firms relatively increased their leverage after the reform.

Essay #4: The Impact of Tax Treaties and Repatriation Taxes on FDI Revisited

10. Different types of investment are adversely affected by changes in repatriation taxes. Fixed assets are negatively affected by higher repatriation taxes while, at the same time, passive investment in financial assets rises. These findings are in accordance with theoretical expectations on the effect of repatriation taxes and they might explain previous findings of an insignificant effect of tax treaties on aggregated FDI.

8. Summary of Results

11. Firms postpone repatriation because they have the general expectation that, due to new tax treaties, high repatriation taxes will decrease in the future. With a lack of local investment opportunities, the respective funds are then invested in the capital market and, in particular, in shares of affiliated firms. Accordingly, I find a positive effect of repatriation taxes on financial investments.
12. The behavioral response to repatriation taxes is also confirmed by corresponding effects of repatriation taxes on financial structures of the subsidiaries, especially regarding the structure of equity finance. Higher repatriation taxes are associated with a significantly higher share of revenue reserves and, at the same time, with significantly smaller new equity injections.

Essay #5: Form Follows Function?

13. If the withholding tax on dividends between the country of a subsidiary and the country of its superior foreign unit is low, this subsidiary tends to be held directly instead of via a holding. Put differently, holdings are generally established at positions of the group structure where they can at least potentially cause savings in withholding taxes. Operative subsidiaries tend to be held via subsidiaries located in countries with low withholding taxes towards the country of the superior foreign-based company unit.
14. Despite general evidence on tax-efficient group structuring, the actual tax savings by multinational holding structures appear rather small. On average, they only lead to a total tax burden reduction of about 2 percentage points as compared to the burden if the applied intermediate holding company was non-existent. Therefore, other determinants of a preferable holding location given the location of a subsidiary, such as the existence of a specific holding regime, need to be regarded.
15. Concerning the tax impact on the horizontal group structure, the existence of a group taxation regime leads to a wider spread of investments. The existence of a group taxation regime increases the number of observed subsidiaries per group in a country by .089. The probability of a split up into at least two subsidiaries per country and year increases by 16.1% if a group taxation regime is in place.

Appendix

Table A-1: Combined statutory profit tax rates in 189 countries from 1996 till 2010

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Albania	30,00%	30,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%	25,00%	23,00%	20,00%	20,00%	10,00%	10,00%	10,00%
Algeria	38,00%	38,00%	38,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Andorra	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Angola	40,00%	40,00%	40,00%	40,00%	40,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Anguilla	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Antigua & Barbuda	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	35,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%
Argentina	33,00%	33,00%	33,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Armenia	20,00%	30,00%	30,00%	30,00%	25,00%	25,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%
Aruba	39,00%	39,00%	39,00%	39,00%	39,00%	39,00%	39,00%	35,00%	35,00%	35,00%	35,00%	28,00%	28,00%	28,00%	28,00%
Australia	36,00%	34,00%	34,00%	36,00%	36,00%	34,00%	34,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Austria	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Azerbaijan	25,00%	32,00%	32,00%	32,00%	32,00%	27,00%	27,00%	25,00%	24,00%	24,00%	22,00%	22,00%	22,00%	22,00%	20,00%
Bahamas	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Bahrain	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Bangladesh	40,00%	40,00%	40,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	27,50%	27,50%
Barbados	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	37,50%	36,00%	36,00%	30,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Belarus	32,00%	32,00%	32,00%	32,00%	27,00%	27,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%
Belgium	40,17%	40,17%	40,17%	40,17%	40,17%	40,17%	40,17%	33,99%	33,99%	33,99%	33,99%	33,99%	33,99%	33,99%	33,99%
Belize	35,00%	35,00%	35,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Bermuda	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Bolivia	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Botswana	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Brazil	25,00%	25,00%	33,00%	33,00%	37,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%

Appendix

British Virgin Islands	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Brunei	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	27,50%	25,50%	23,50%
Bulgaria	40,00%	40,00%	37,00%	34,30%	32,50%	28,00%	23,50%	23,50%	19,50%	15,00%	15,00%	10,00%	10,00%	10,00%	10,00%
Cambodia	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%
Cameroon	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%
Canada	44,60%	44,60%	44,60%	44,60%	44,60%	42,10%	38,60%	36,60%	36,10%	36,10%	36,10%	36,10%	33,50%	33,00%	31,00%
Canary Islands	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	38,01%	35,74%	35,74%	35,74%
Cayman Islands	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Ceuta and Melilla	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	38,01%	35,74%	35,74%	35,74%
Chile	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	16,00%	16,50%	16,50%	17,00%	17,00%	17,00%	17,00%	17,00%	17,00%
China	43,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	25,00%	25,00%	25,00%
Columbia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	34,00%	33,00%	33,00%	33,00%
Congo	49,00%	45,00%	45,00%	45,00%	45,00%	45,00%	40,00%	39,00%	38,00%	38,00%	38,00%	38,00%	38,00%	38,00%	36,00%
Costa Rica	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Cote d'Ivoire	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	27,00%	25,00%	25,00%	25,00%
Croatia	25,00%	35,00%	35,00%	35,00%	35,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%
Cyprus	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	15,00%	15,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Czech Republic	39,00%	39,00%	35,00%	35,00%	31,00%	31,00%	31,00%	31,00%	28,00%	26,00%	24,00%	24,00%	21,00%	20,00%	19,00%
Dem. Republic of Congo	50,00%	50,00%	50,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%
Denmark	34,00%	34,00%	32,00%	32,00%	32,00%	30,00%	30,00%	30,00%	30,00%	28,00%	28,00%	25,00%	25,00%	25,00%	25,00%
Djibouti	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Dominica	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Dominican Republic	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	30,00%	29,00%	25,00%	25,00%	25,00%
Ecuador	25,00%	32,00%	36,25%	15,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Egypt	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	20,00%	20,00%	20,00%	20,00%	20,00%
El Salvador	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Equatorial Guinea	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	35,00%	35,00%	35,00%
Estonia	26,00%	26,00%	26,00%	26,00%	26,00%	26,00%	26,00%	26,00%	26,00%	24,00%	23,00%	22,00%	21,00%	21,00%	21,00%
Ethiopia	50,00%	50,00%	50,00%	50,00%	40,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Faroe Islands	27,00%	27,00%	27,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	18,00%	18,00%	18,00%

Appendix

Fiji	35,00%	35,00%	35,00%	35,00%	35,00%	34,00%	32,00%	32,00%	31,00%	31,00%	31,00%	31,00%	31,00%	29,00%	28,00%
Finland	28,00%	28,00%	28,00%	28,00%	29,00%	29,00%	29,00%	29,00%	29,00%	26,00%	26,00%	26,00%	26,00%	26,00%	26,00%
France	36,66%	36,66%	41,66%	40,00%	36,66%	36,43%	35,43%	35,43%	35,43%	34,93%	34,43%	34,43%	34,43%	34,43%	34,43%
French Polynesia	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	40,00%	40,00%	40,00%	40,00%	40,00%
Gabon	40,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Gambia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	33,00%
Georgia	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	15,00%	15,00%	15,00%
Germany (distributed)	38,05%	38,07%	37,55%	37,57%	37,59%	39,35%	39,35%	40,66%	39,38%	39,43%	39,38%	39,35%	30,95%	30,95%	30,95%
Germany (retained)	57,25%	57,25%	56,51%	52,35%	52,35%	39,35%	39,35%	40,66%	39,38%	39,43%	39,38%	39,35%	30,95%	30,95%	30,95%
Ghana	35,00%	35,00%	35,00%	35,00%	32,50%	32,50%	32,50%	32,50%	32,50%	28,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Gibraltar	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	33,00%	27,00%	22,00%
Greece	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	32,00%	29,00%	25,00%	25,00%	35,00%	34,00%
Greenland	35,00%	35,00%	35,00%	35,00%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%	31,80%
Grenada	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Guadeloupe	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%
Guatemala	30,00%	30,00%	30,00%	27,50%	25,00%	31,00%	31,00%	31,00%	31,00%	31,00%	31,00%	31,00%	31,00%	31,00%	31,00%
Guernsey	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	0,00%	0,00%	0,00%
Guinea	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Guyana	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%	45,00%
Haiti	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Honduras	40,25%	40,25%	40,25%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Hong Kong	16,50%	16,50%	16,50%	16,00%	16,00%	16,00%	16,00%	16,00%	17,50%	17,50%	17,50%	17,50%	16,50%	16,50%	16,50%
Hungary	19,64%	19,64%	19,64%	19,64%	19,64%	19,64%	19,64%	19,64%	17,76%	17,71%	17,56%	21,38%	21,44%	21,44%	20,84%
Iceland	33,00%	33,00%	30,00%	30,00%	30,00%	30,00%	18,00%	18,00%	18,00%	18,00%	18,00%	18,00%	15,00%	15,00%	18,00%
India	43,00%	35,00%	35,00%	35,00%	38,50%	39,55%	35,70%	36,75%	38,88%	36,59%	33,66%	33,99%	33,99%	33,99%	33,99%
Indonesia	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	28,00%	30,00%
Iran	54,00%	54,00%	54,00%	54,00%	54,00%	54,00%	54,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Ireland	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	12,50%	12,50%	12,50%	12,50%	12,50%	12,50%	12,50%	12,50%
Isle of Man	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%	0,00%	0,00%	0,00%	0,00%
Israel	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	34,00%	31,00%	29,00%	27,00%	26,00%	25,00%

Appendix

Italy	53,20%	53,20%	41,25%	41,25%	41,25%	40,25%	40,25%	38,25%	37,25%	37,25%	37,25%	37,25%	31,12%	31,12%	31,12%
Jamaica	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%	33,33%
Japan	51,00%	51,00%	51,00%	48,00%	42,00%	42,00%	42,00%	42,00%	42,00%	40,76%	40,76%	40,76%	40,76%	40,76%	40,76%
Jersey	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%
Jordan	55,00%	35,00%	35,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Kazakhstan	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	20,00%	20,00%
Kenya	35,00%	35,00%	35,00%	33,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Kuwait	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	55,00%	15,00%	15,00%	15,00%
Kyrgyzstan	10,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	20,00%	20,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Latvia	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	22,00%	19,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%
Lebanon	10,00%	10,00%	10,00%	10,00%	10,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%
Lesotho	40,00%	40,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Liberia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Libya	60,00%	60,00%	60,00%	35,00%	35,00%	35,00%	35,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%
Liechtenstein	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%
Lithuania	29,00%	29,00%	29,00%	29,00%	24,00%	24,00%	22,00%	15,00%	15,00%	15,00%	19,00%	18,00%	15,00%	20,00%	15,00%
Luxembourg	40,29%	39,34%	37,45%	37,45%	37,45%	37,45%	30,38%	30,38%	30,38%	30,38%	29,32%	29,32%	29,63%	28,59%	28,59%
Macao	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%
Macedonia	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	15,00%	12,00%	10,00%	10,00%	10,00%
Malawi	38,00%	38,00%	38,00%	38,00%	38,00%	38,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Malaysia	30,00%	30,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	27,00%	26,00%	25,00%	25,00%
Maldives	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Malta	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Mariana Islands	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Marocco	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%
Marshall Islands	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Martinique	36,66%	36,66%	41,66%	40,00%	36,66%	36,43%	35,43%	35,43%	35,43%	34,93%	34,43%	34,43%	34,43%	34,43%	34,43%
Mauritania	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	25,00%	25,00%	25,00%	25,00%
Mauritius	35,00%	35,00%	35,00%	35,00%	35,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	22,50%	15,00%	15,00%	15,00%
Mexico	34,00%	34,00%	34,00%	35,00%	35,00%	35,00%	35,00%	34,00%	33,00%	30,00%	29,00%	28,00%	28,00%	28,00%	30,00%

Appendix

Micronesia	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Moldova	32,00%	32,00%	32,00%	25,00%	25,00%	28,00%	25,00%	22,00%	20,00%	18,00%	15,00%	15,00%	0,00%	0,00%	0,00%
Montserrat	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Mozambique	45,00%	45,00%	45,00%	35,00%	35,00%	35,00%	35,00%	32,00%	32,00%	32,00%	32,00%	32,00%	32,00%	32,00%	32,00%
Myanmar	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Namibia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Nauru	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Nepal	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Netherlands	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	34,50%	34,50%	34,50%	31,50%	29,60%	25,50%	25,50%	25,50%	25,50%
Netherlands Antilles	39,00%	39,00%	39,00%	39,00%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%	34,50%
New Caledonia	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
New Zealand	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	30,00%	30,00%	30,00%
Nicaragua	30,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Nigeria	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Norway	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%
Oman	50,00%	50,00%	30,00%	30,00%	30,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%	12,00%
Pakistan	43,00%	30,00%	30,00%	35,00%	43,00%	34,65%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Palau	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Panama	30,00%	37,00%	37,00%	37,00%	37,00%	37,00%	37,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Papua New Guinea	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Paraguay	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	20,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Peru	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	27,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Philippines	35,00%	35,00%	34,00%	33,00%	32,00%	32,00%	32,00%	32,00%	32,00%	32,00%	35,00%	35,00%	35,00%	30,00%	30,00%
Poland	40,00%	38,00%	36,00%	34,00%	30,00%	28,00%	28,00%	27,00%	19,00%	19,00%	19,00%	19,00%	19,00%	19,00%	19,00%
Portugal	36,00%	36,00%	34,00%	34,00%	32,00%	32,00%	30,00%	30,00%	25,00%	25,00%	27,50%	26,50%	26,50%	26,50%	26,50%
Qatar	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	10,00%
Romania	38,00%	38,00%	38,00%	38,00%	25,00%	25,00%	25,00%	25,00%	25,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%
Russian Federation	35,00%	35,00%	35,00%	35,00%	30,00%	35,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	20,00%	20,00%
Rwanda	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Samoa	39,00%	39,00%	39,00%	39,00%	39,00%	35,00%	29,00%	29,00%	29,00%	29,00%	29,00%	27,00%	27,00%	27,00%	27,00%

Appendix

San Marino	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%	24,00%
Saudi Arabia	45,00%	45,00%	45,00%	45,00%	45,00%	30,00%	30,00%	30,00%	30,00%	30,00%	20,00%	20,00%	20,00%	20,00%	20,00%
Senegal	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	33,00%	33,00%	33,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Serbia	25,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	14,00%	10,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Seychelles	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	33,00%
Sierra Leone	47,20%	47,20%	47,20%	47,20%	45,00%	45,00%	45,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Singapore	27,00%	26,00%	26,00%	26,00%	26,00%	25,50%	24,50%	22,00%	22,00%	20,00%	20,00%	20,00%	18,00%	18,00%	17,00%
Slovak Republic	40,00%	40,00%	40,00%	40,00%	29,00%	29,00%	25,00%	25,00%	19,00%	19,00%	19,00%	19,00%	19,00%	19,00%	19,00%
Slovenia	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	23,00%	22,00%	21,00%	20,00%
Solomon Islands	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
South Africa	35,00%	42,20%	42,20%	42,20%	37,80%	30,00%	30,00%	30,00%	30,00%	30,00%	29,00%	29,00%	29,00%	28,00%	28,00%
South Korea	28,00%	30,80%	30,80%	30,80%	30,80%	30,80%	29,70%	29,70%	29,70%	27,50%	27,50%	27,40%	25,00%	25,00%	22,00%
Spain	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	40,30%	38,01%	35,74%	35,74%	35,74%
Sri Lanka	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	42,00%	32,50%	35,00%	32,50%	32,50%	35,00%	35,00%	35,00%	35,00%
St Kitts and Nevis	40,00%	40,00%	38,00%	38,00%	38,00%	38,00%	38,00%	38,00%	38,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
St Lucia	33,30%	33,30%	33,30%	33,30%	33,30%	33,30%	33,30%	33,30%	33,00%	33,00%	33,30%	33,30%	33,30%	33,30%	33,30%
St Vincent	33,30%	33,30%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Sudan	60,00%	60,00%	60,00%	60,00%	40,00%	40,00%	40,00%	40,00%	40,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Surinam	45,00%	38,00%	38,00%	38,00%	38,00%	38,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%	36,00%
Svalbard	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%	16,00%
Swaziland	37,50%	37,50%	37,50%	37,50%	37,50%	37,50%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Sweden	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	28,00%	26,30%	26,30%
Switzerland	25,82%	25,82%	25,09%	25,09%	24,93%	24,70%	24,42%	24,10%	21,32%	21,32%	21,32%	21,32%	21,20%	21,20%	21,20%
Syria	50,00%	50,00%	50,00%	45,00%	45,00%	45,00%	45,00%	35,00%	35,00%	35,00%	35,00%	28,00%	28,00%	28,00%	28,00%
Taiwan	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	20,00%
Tanzania	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Thailand	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
Trinidad and Tobago	38,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%	25,00%	25,00%
Tunisia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	33,00%	33,00%	35,00%	35,00%	30,00%	30,00%	30,00%	30,00%
Turkey	44,00%	44,00%	44,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	33,00%	20,00%	20,00%	20,00%	20,00%	20,00%

Appendix

Turks & Caicos Islands	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Uganda	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%
UK	33,00%	33,00%	31,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	28,00%	28,00%	28,00%
Ukraine	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%	25,00%
United Arab Emirates	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Uruguay	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	30,00%	32,00%	28,00%	30,00%	30,00%	25,00%	25,00%	25,00%	25,00%
US Virgin Islands	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%	38,50%
USA	41,18%	41,18%	41,18%	41,18%	41,17%	41,17%	41,17%	41,18%	41,18%	41,18%	41,18%	41,18%	38,30%	38,30%	37,87%
Uzbekistan	37,00%	37,00%	35,00%	33,00%	33,00%	33,00%	33,00%	20,00%	18,00%	15,00%	12,00%	10,00%	10,00%	10,00%	10,00%
Vanuatu	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%
Venezuela	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%	34,00%
Vietnam	25,00%	30,00%	35,00%	35,00%	32,50%	32,00%	32,00%	32,00%	28,00%	28,00%	28,00%	28,00%	28,00%	25,00%	25,00%
West Bank/Gaza	38,50%	38,50%	38,50%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	20,00%	15,00%	15,00%	15,00%	15,00%	15,00%
Yemen	36,00%	32,00%	32,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Yugoslavia	25,00%	25,00%	25,00%	25,00%	20,00%	20,00%	20,00%	20,00%	14,00%	14,00%	10,00%	10,00%	10,00%	10,00%	10,00%
Zambia	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%	35,00%
Zimbabwe	37,50%	37,50%	37,50%	35,00%	35,00%	30,90%	30,90%	30,90%	30,90%	30,90%	30,90%	30,90%	30,90%	30,90%	30,90%

Combined statutory tax rates on corporate profits. Source: own data collection based on information in tax handbooks and databases of the International Bureau of Fiscal Documentation (IBFD) as well as in tax handbooks of the big four tax and audit companies Deloitte, Ernst & Young, PwC and KPMG.

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST
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The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

[illegible]

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	ES
...	15	15	0	0	0	15	0	0	15	0	0	0	15	15	0	...

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
----------------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST
----------------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

Appendix

Table A-2f: Withholding tax rates on dividends in 2001

[illegible]

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

[illegible]

[illegible]

Appendix

Table A-2i: Withholding tax rates on dividends in 2004

[illegible]

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

[illegible]

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[illegible]

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	E
----------------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

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Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY			
Australia	AUS		.15	.15	.3	.3	.3	.3	.3	.3	.15	.3	.3	.3	.15	.15	.3	.3	.0	.15	.15	.3	.3	.15	.3	.15	.15	.1	.15	.15	.15	.3	.3	.3	.3	.15	.15	.0	.15	.15	.05	.3	.15	.3	.05	.05	.15	.15	.3	.15	.15	.15	.3	.3	.0	.05	.3					
Austria	AUT	.15		.0	.25	.15	.0	.05	.25	.25	.07	.25	.0	.0	.0	.0	.25	.0	.0	.15	.15	.0	.0	.25	.0	.25	.1	.0	.0	.1	.05	.0	.15	.0	.05	.05	.0	.15	.0	.15	.0	.15	.0	.25	.0	.0	.05	.0	.0	.15	.15	.3	.0	.25	.1	.25	.0	.05	.25			
Belgium	BEL	.15	.0		.25	.1	.0	.05	.25	.25	.1	.25	.05	.0	.0	.0	.25	.0	.0	.0	.0	.0	.05	.05	.15	.1	.05	.1	.0	.05	.15	.0	.25	.0	.15	.0	.05	.0	.15	.0	.25	.0	.0	.0	.1	.15	.0	.0	.0	.0	.1	.15	.05	.0	.0	.25						
Bermuda	BMU		.0	.0		.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0					
Brazil	BRA		.0	.0	.0		.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0				
Bulgaria	BGR	.05	.0	.0	.05	.05		.05	.05	.05	.05	.05	.05	.0	.0	.05	.0	.0	.0	.0	.0	.0	.05	.0	.05	.05	.0	.05	.05	.0	.05	.05	.07	.0	.05	.0	.05	.0	.05	.05	.0	.0	.0	.05	.05	.0	.0	.0	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05				
Canada	CAN	.05	.05	.05	.25	.15	.1		.25	.1	.1	.25	.05	.15	.05	.05	.18	.05	.05	.05	.05	.25	.25	.05	.05	.15	.1	.05	.15	.05	.05	.05	.25	.05	.1	.15	.15	.05	.05	.15	.05	.1	.15	.05	.1	.15	.05	.05	.15	.05	.05	.25	.15	.25	.05	.05	.05	.25				
Cayman Islands	CAY	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0			
Chile	CHL	.35	.35	.35	.35	.1	.35	.1	.35		.35	.35	.05	.35	.35	.05	.35	.35	.35	.35	.15	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.05	.35	.35	.35	.35	.05	.35	.35	.15	.05	.1	.05	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35	.35
China	CHN	.1	.07	.1	.1	.1	.1	.1	.1	.1		.1	.05	.1	.1	.15	.1	.05	.1	.1	.1	.1	.05	.05	.15	.05	.1	.1	.05	.1	.1	.05	.05	.1	.05	.05	.1	.05	.1	.1	.1	.1																				

The figures shown in the table are those of the dividend flowing from a company located in the country of the left column ("Source Country") to the owner company located in the country of the individual columns. For example, a dividend paid from a company in the Cayman Islands to its owner company in the United States is taxed at 0%, whereas a dividend flowing from the United States to the Cayman Islands is subject to 30% withholding tax in the United States.

Appendix

Table A-3a: Methods of dealing with incoming dividends in 1996

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	IC	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO		
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Croatia	CRO	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Czech Republic	CZE	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX		EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO
Dominican Republic	DOM	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	IC	EX		EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC		EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX		.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX		EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95		EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Greece	GRC	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX		EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Iceland	ISL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Luxembourg	LUX																																																										

Appendix

Table A-3b: Methods of dealing with incoming dividends in 1997

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	IC	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Croatia	CRO	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Czech Republic	CZE	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX		EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO
Dominican Republic	DOM	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	IC	EX	DC	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Greece	GRC	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Iceland	ISL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX</																																													

Appendix

Table A-3c: Methods of dealing with incoming dividends in 1998

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	IC	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Croatia	CRO	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Czech Republic	CZE	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX		EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO		
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO
Dominican Republic	DOM	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO	
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO	
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Greece	GRC	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO	
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Iceland	ISL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX</																																													

Appendix

Table A-3d: Methods of dealing with incoming dividends in 1999

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	IC	EX	DC	EX	.95	.95	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	IC	EX	EX	IC	EX	DC	EX	.95	.95	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Chile	CHL	DC	EX	.95	DO	IC	DC	IC	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX		EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	IC	EX	DC	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC		EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX		EX	.95	.95	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Greece	GRC	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX		.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	IC	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	DE	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX										

Appendix

Table A-3e: Methods of dealing with incoming dividends in 2000

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	DC	EX	DC	DE	IC	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	IC	EX	DC	EX	DC	DE	IC	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	DC	EX	DC	DE	IC	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	DC	.95	IC	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	DC	DE	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Greece	GRC	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	DC	DE	IC	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	DE	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	DC	DE	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	IC	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	</																																															

Appendix

Table A-3f: Methods of dealing with incoming dividends in 2001

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	DE	EX	DC	EX	EX	.95	.95	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	EX	.95	.95	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	DE	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	EX	.95	.95	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Canada	CAN	DC	EX	.95	DO	IC	DC		DO	IC	IC	IC	IC	EX	EX	DE	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	DE	EX	DC	EX	DC	DE	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	DC	DE	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	DC	DE	.95	.95	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX		EX	DC	EX	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO			
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	DE	EX		EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC		EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX		EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX		.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95			EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX	EX	.95	.95		EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE		DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	.95	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Ireland	IRL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC		IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	DE	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Malaysia	MAL	DC	EX	.95																																																							

Appendix

Table A-3g: Methods of dealing with incoming dividends in 2002

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	EX	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO				
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	IC	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX																										

Appendix

Table A-3h: Methods of dealing with incoming dividends in 2003

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DE	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	EX	DC	EX	DC	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	DC	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO							
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	EX	IC	IC	DO						
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO						
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95		EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	EX	DC	EX	DC	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO						
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	EX	DC	EX	DC	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO						
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO					
Malta	MLT	DC	EX	.																																																							

Appendix

Table A-3i: Methods of dealing with incoming dividends in 2004

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DE	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	EX	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95		EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95		EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO	
Latvia	LVA	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Luxembourg	LUX	DC	EX	.95	DO																																																						

Appendix

Table A-3j: Methods of dealing with incoming dividends in 2005

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	DC	IC	IC	IC	IC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO					
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	EX	EX	DC		EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX		.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95		EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Latvia	LVA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	EX	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO</			

Appendix

Table A-3k: Methods of dealing with incoming dividends in 2006

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	DE	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO					
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	EX	EX	EX	DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO					
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO					
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO					
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	DE	EX	DC	DE	.95	.95	IC	EX	EX	EX	DE	IC	DC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Latvia	LVA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		EX	EX	EX	DC	DE	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Lithuania	LTU	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC		EX	EX	EX	DC	EX	EX																																									

Appendix

Table A-3I: Methods of dealing with incoming dividends in 2007

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UAE	UKI	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	IC	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DE	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	IC	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	EX	EX	EX	EX	DC	EX	DC	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	EX	EX	DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	IC	DC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX		EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	EX	EX	DC		EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95		EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
India	IND	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Latvia	LVA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Lithuania	LTU	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	EX	IC	DC	EX	IC	EX	EX	EX										

Appendix

Table A-3m: Methods of dealing with incoming dividends in 2008

Source Country	Code	AUS	AUT	BEL	BMU	BRA	BGR	CAN	CAY	CHL	CHN	COL	CRO	CYP	CZE	DNK	DOM	EST	FIN	FRA	GER	GRC	HKG	HUN	ISL	IND	IDN	IRL	ITA	JPN	KOR	LVA	LIE	LTU	LUX	MAL	MLT	MEX	NLD	NZL	NOR	PER	POL	PRT	ROM	RUS	SGP	SVK	SVN	ESP	SWE	CHE	TWN	THA	TUR	UKR	USA	URY
Australia	AUS		EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DC	IC	DC	DC	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO	
Austria	AUT	DC		.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	EX	DC	IC	EX	IC	DC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO
Belgium	BEL	DC	EX		DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	EX	DC	IC	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Bermuda	BMU	DC	EX	.95		IC	DC	IC	DO	IC	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	EX	DC	IC	DO	IC	IC	DO	IC	DO	IC	IC	DO				
Brazil	BRA	DC	EX	.95	DO		DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	IC	IC	IC	EX	EX	DC	IC	DC	IC	DC	EX	EX	EX	EX	DC	IC	IC	DO			
Bulgaria	BGR	DC	EX	.95	DO	IC		EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	IC	EX	EX	DC	IC	EX	EX	EX	EX	DC	IC	EX	EX	EX	DC	IC	EX	DO		
Canada	CAN	DC	EX	.95	DO	IC	EX		DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Cayman Islands	CAY	DC	EX	.95	DO	IC	DC	IC		IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	DC	IC	DO	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO				
Chile	CHL	DC	EX	.95	DO	IC	DC	EX	DO		IC	IC	EX	IC	DE	EX	DC	EX	DC	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	IC	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
China	CHN	DC	EX	.95	DO	IC	EX	EX	DO	IC		IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	DC	IC	IC	DO	EX	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Colombia	COL	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC		IC	IC	DE	EX	DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Croatia	CRO	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC		IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO				
Cyprus	CYP	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC		EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	EX	EX	DC	IC	DO	IC	EX	EX	EX	DC	IC	DO	IC	IC	DO				
Czech Republic	CZE	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX		EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Denmark	DNK	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX		DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Dominican Republic	DOM	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	DE	EX		DC	EX	DC	DE	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	IC	DO	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Estonia	EST	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	EX	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Finland	FIN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
France	FRA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO				
Germany	GER	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Greece	GRC	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Hong Kong	HKG	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	DE	EX	DC	EX	DC	DE	.95	IC		EX	DO	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	IC	EX	EX	DC	IC	IC	DO	IC	IC	DO			
Hungary	HUN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO			
Iceland	ISL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX		IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO			
India	IND	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Indonesia	IDN	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	IC	IC	EX	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Ireland	IRL	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC		.95	IC	IC	EX	EX	EX	EX	EX	EX	IC	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Italy	ITA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC		IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	IC	EX	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO			
Japan	JPN	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Korea	KOR	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	IC	EX	DC	EX	EX	.95	.95	EX	EX	EX	DE	IC	DC	IC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	EX	IC	IC	DO		
Latvia	LVA	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Liechtenstein	LIE	DC	EX	.95	DO	IC	DC	IC	DO	IC	IC	IC	IC	IC	IC	EX	DC	EX	DC	DE	.95	IC	EX	EX	DO	IC	DC	IC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	IC	EX	IC	DC	IC	DO	IC	EX	EX	EX	DC	IC	IC	DO	IC	IC	DO		
Lithuania	LTU	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	EX	IC	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	.95	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	IC	EX	IC	DC	IC	DO	EX	EX	EX	EX	DC	IC	EX	DO	IC	IC	DO		
Luxembourg	LUX	DC	EX	.95	DO	IC	EX	EX	DO	IC	IC	IC	IC	IC	EX	DC	EX	EX	.95	.95	EX	EX	EX	EX	EX	IC	DC	IC	IC	IC	IC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	DC	IC	EX	EX	DC	IC	EX	DO	IC	IC	DO	
Malaysia	MAL	DC	EX	.95	DO	IC	DC	EX	DO	IC	IC	IC	IC	IC	EX	EX	DC	EX	EX	.95	.95	IC	EX	EX	DE	IC	DC	IC	IC	IC	IC	DC	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX	EX													

The abbreviations used in the table are the following: EX = exemption, 95 = exemption by 95%, IC = indirect credit, DC = direct credit, DE = deduction, DO = double taxation. The methods refer to a dividend flowing from a company located in the country of the column to the left ("Source Country") to its owner company located in the country of the individual columns of the table. For example, France exempts a dividend from a Japanese company by 95% whereas Japan uses the indirect credit method for dividends flowing in from French companies.

Full List of References

- Aarbu, K.O. and J.K. MacKie-Mason (2003): Explaining Underutilization of Tax Depreciation Deductions: Empirical Evidence from Norway, *International Tax and Public Finance* 10, 229-257.
- Aggarwal, R., and N.A. Kyaw (2008): Internal Capital Networks as a Source of MNC Competitive Advantage: Evidence from Foreign Subsidiary Capital Structure Decisions, *Research in International Business and Finance* 22, 409-439.
- Albring, S., D.S. Dhaliwal, I.K. Khurana and R. Pereira (2012): Short Term Incentive Effects of a Reduction in the NOL Carryback Period, *The Journal of the American Taxation Association*, published online October 2011, print version forthcoming.
- Albring, S., L.F. Mills and K.J. Newberry (2010): *Do Debt Constraints Influence Firms' Sensitivity to a Temporary Tax Holiday on Repatriations?*, Syracuse University working paper.
- Almeida, H., S. Y. Park, M. Subrahmanyam, and D. Wolfenzon (2011): The Structure and Formation of Business Groups: Evidence from Korean Chaebols, *Journal of Financial Economics* 99, 447-475.
- Altshuler, R. and A.J. Auerbach (1990): The Significance of Tax Law Asymmetries: An Empirical Investigation, *Quarterly Journal of Economics* 1990, 61-89.
- Altshuler, R. and H. Grubert (2003): Repatriation Taxes, Repatriation Strategies And Multinational Financial Policy, *Journal of Public Economics* 87, 73-107.
- Altshuler, R., A.J. Auerbach, M. Cooper and M. Knittel (2008): *Understanding U.S. corporate tax losses*, NBER Working Paper No. 14405.
- Alvarez, L. and E. Koskela (2008): Progressive Taxation, Tax Exemption, and Irreversible Investment under Uncertainty, *Journal of Public Economic Theory* 10, 149-169.
- Alworth, J. and G. Arachi (2001): The Effect of Taxes on Corporate Financing Decisions: Evidence from a Panel of Italian Firms, *International Tax and Public Finance* 8, 353 - 376.
- An, Z. (2011): Taxation and foreign direct investment (FDI): Empirical Evidence from a Quasi-Experiment in China, *International Tax and Public Finance*, online since October 29, 2011, printed version forthcoming.
- An, Z. (2012): Taxation and Capital Structure: Empirical Evidence from a Quasi-Experiment in China, *Journal of Corporate Finance* 18, 683-689.
- Anderson, T. and C. Hsiao (1982): Formulation and Estimation of Dynamic Models Using Panel Data, *Journal of Econometrics* 18, 47-82.
- Andrews, D. and M. Buchinsky (2002): On the Number of Bootstrap Repetitions for BC_a Confidence Intervals, *Econometric Theory* 18, 962-984.
- Angrist, J. and J.S. Pischke (2009): *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton and Oxford 2009.
- Antoniou, A., Y. Guney, and K. Paudya (2008): The Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions, *Journal of Financial and Quantitative Analysis* 43, 59-92.
- Arellano, M. and S. Bond (1991): Some Tests of Specification for Panel Data: Evidence and an Application to Employment Equations, *Review of Economic Studies* 58, 277-297.

- Auer, L. (2007): *Ökonometrie*, fourth edition, Berlin/Heidelberg 2007.
- Auerbach, A.J. (1979): Wealth Maximization and the Cost of Capital, *Quarterly Journal of Economics* 94, 433-436.
- Auerbach, A.J. (1983): Taxation, Corporate Financial Policy and the Cost of Capital, *Journal of Economic Literature* 21, 905-940.
- Auerbach, A.J. (1986): The Dynamic Effects of Tax Law Asymmetries, *Review of Economic Studies* 53, 205-225.
- Auerbach, A.J. and J.M. Poterba (1987): *Tax Loss Carryforwards and Corporate Tax Incentives*, in M. Feldstein (ed.): *The Effects of Taxation on Capital Accumulation*, Chicago, 305-342.
- Auerbach, A.J. and K.A. Hassett (2000): *On the Marginal Source of Investment Funds*, Trans-Atlantic Public Economics Seminar, Gerzensee, Switzerland, May 2000.
- Ayers, B.C., C.B. Cloyd and J.R. Robinson (2001): The Influence of Income Taxes on the Use of Inside and Outside Debt by Small Businesses, *National Tax Journal* 54, 27-55.
- Azémar, C., R. Desbordes, and J. Muchielli (2007): Do tax sparing agreements contribute to the attraction of FDI in developing countries?, *International Tax and Public Finance* 14, 543-562.
- Bach, S. and H. Buslei (2009): *Zinsschranke trifft vor allem Grossunternehmen*, DIW-Wochenbericht 76, 283-287.
- Barclay M., S. Heitzman and C.W. Smith Jr. (2012): *Debt and Taxes: Evidence from the Real Estate Industry*, University of Rochester working paper.
- Barion, F., R. Miniaci, P.M. Panteghini, and M.L. Parisi (2010): *Profit Shifting via Debt Financing in Europe*, CESifo Working Paper.
- Barlev, B. and H. Levy (1975): Loss Carryback and Carryover Provision: Effectiveness and Economic Implications, *National Tax Journal* 28, 173-184.
- Barrios, S., Huizinga, H., Laeven, L. and Nicodème, G. (2008): *International Taxation and Multinational Firm Location Decisions*, Oxford University Centre for Business Taxation, Working Paper 08/25.
- Bartholdy, J., and C. Mateus (2008): *Taxes and Corporate Debt Policy: Evidence for Unlisted Firms of Sixteen European Countries*, Working Paper, University of Aarhus.
- Becker, J. (2010): *Die Reform der Besteuerung ausländischen Einkommens*, Tätigkeitsbericht 2009/2010 der Max-Planck-Gesellschaft.
- Becker, J. and C. Fuest (2006): Ist Deutschland ein Hoch- oder Niedrigsteuerland? Der Versuch einer Synthese, *Perspektiven der Wirtschaftspolitik* 7, 35-42.
- Becker, J. and C. Fuest (2007): Why is There Corporate Taxation? The Role of Limited Liability Revisited, *Journal of Economics* 92, 1-10.
- Becker, J. and N. Riedel (2012): Cross-border Tax Effects on Affiliate Investment—Evidence from European Multinationals, *European Economic Review* 56, 436-450.
- Becker, J., Fuest, C. and C. Spengel (2006): Konzernsteuerquote und Investitionsverhalten, *Zeitschrift für betriebswirtschaftliche Forschung* 58, 730-742.
- Becker, J., Fuest, C. and T. Hemmelgarn (2006): *Corporate Tax Reform and Foreign Direct Investment in Germany – Evidence from Firm-Level Data*, Working Paper as of August 2006.

- Becker, S.O., Egger, P. and V. Merlo (2012): How Low Business Tax Rates Attract MNE Activity: Municipality-level Evidence from Germany, *Journal of Public Economics* 96, 698-711.
- Bellak, C. and M. Leibrecht (2010): Does Lowering Dividend Tax Rates Increase Dividends Repatriated? Evidence of Intrafirm Cross-Border Dividend Repatriation Policies by German Multinational Enterprises, *FinanzArchiv* 66, 350-383.
- Bénassy-Quéré, A., L. Fontagné and A. Lahrière-Révil (2005): How Does FDI React to Corporate Taxation?, *International Tax and Public Finance*, 12, 583–603.
- Bernasconi, M., A. Marenzi and L. Pagani (2005): Corporate Financing Decisions and Non-Debt Tax Shields: Evidence from Italian Experiences in the 1990s, *International Tax and Public Finance* 12, 741-773.
- Bertrand, M., E. Duflo, and S. Mullainathan (2004): How Much Should we Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics* 119, 249-275.
- Blaufus, K. and D. Lorenz (2009): Die Zinsschranke in der Krise, *Steuer und Wirtschaft* 86, 323 - 332.
- Blaufus, K. and D. Lorenz (2009): Wem droht die Zinsschranke? Eine empirische Untersuchung zur Identifikation der Einflussfaktoren, *Zeitschrift für Betriebswirtschaft* 79, 503 - 526.
- Blonigen, B.A. (2005): A Review of the Empirical Literature on FDI Determinants, *Atlantic Economic Journal* 33, 383–403.
- Blonigen, B.A. and R.B. Davies (2004): The Effects of Bilateral Tax Treaties on U.S. FDI Activity, *International Tax and Public Finance* 11, 601–622.
- Blonigen, B.A., R.B. Davies and K. Head (2003): Estimating the Knowledge-Capital Model of the Multinational Enterprise: Comment, *American Economic Review* 93, 980-994.
- Blouin, J. and L. Krull (2009): Bringing It Home: A Study of the Incentives Surrounding the Repatriation of Foreign Earnings under the American Jobs Creation Act of 2004, *Journal of Accounting Research*, 47, 1027-1059.
- Blouin, J., J.E. Core, and W. Guay (2010): Have the Tax Benefits of Debt Been Overestimated? *Journal of Financial Economics* 98, 195-213.
- Bolik, A., C. Fuest and M. Ortmann-Babel (2010): *Studie zur Evaluation der Gegenfinanzierung der Unternehmensteuerreform 2008*, Ernst & Young GmbH.
- BR-Drucksache 220/07 (2007): Gesetzentwurf der Bundesregierung, Entwurf eines Unternehmensteuerreformgesetzes 2008.
- Buettner, T. and C. Fuest (2010): The Role of the Corporate Income Tax as an Automatic Stabilizer, *International Tax and Public Finance* 17, 686-698.
- Buettner, T. and G. Wamser (2009): The Impact of Non-Profit Taxes on Foreign Direct Investment: Evidence from German Multinationals, *International Tax and Public Finance* 16, 298-320.
- Buettner, T. and M. Ruf (2007): Tax Incentives and the Location of FDI: Evidence from a Panel of German Multinationals, *International Tax and Public Finance* 14, 151-164.
- Buettner, T., and G. Wamser (2009): *Internal Debt and Multinationals' Profit Shifting - Empirical Evidence from Firm-Level Panel Data*, Working Paper, Oxford University Centre for Business Taxation.

- Buettner, T., and G. Wamser (2009): The Impact of Non-Profit Taxes on Foreign Direct Investment: Evidence from German Multinationals, *International Tax and Public Finance* 16, 298–320.
- Buettner, T., M. Overesch, U. Schreiber and G. Wamser (2012): The Impact of Thin-Capitalization Rules on the Capital Structure of Multinational Firms, *Journal of Public Economics*, forthcoming.
- Buettner, T., M. Overesch, U. Schreiber und G. Wamser (2008): *The Impact of Thin Capitalization Rules on Multinationals' Financing and Investment Decisions*, Bundesbank Discussion Paper 03/2008, Frankfurt.
- Buettner, T., M. Overesch, U. Schreiber, and G. Wamser (2009): Taxation and Capital Structure Choice – Evidence from a Panel of German Multinationals, *Economics Letters* 105, 309-311.
- Byoun, S. (2008): How and When Do Firms Adjust Their Capital Structures toward Targets?, *Journal of Finance* 63, 3069-3096.
- Cameron, C. and P. Trivedi (2009): *Microeconometrics using Stata*, College Station, Texas.
- Carr, D.L., J.R. Markusen and K.E. Maskus (2001): Estimating the Knowledge-Capital Model of the Multinational Enterprise, *American Economic Review* 91, 693-708.
- Chirinko, R.S. (1993): Business Fixed Investment Spending: Modelling Strategies, Empirical Results, and Policy Implications, *Journal of Economic Literature* 31, 1875-1911.
- Chisik, R. and R.B. Davies (2004a): Asymmetric FDI and Tax-Treaty Bargaining: Theory and Evidence, *Journal of Public Economics* 88, 1119-1148.
- Chisik, R. and R.B. Davies (2004b): Gradualism in Tax Treaties with Irreversible Foreign Direct Investment, *International Economic Review* 45, 113-139.
- Clark, W.S. (2000): Tax Incentives for Foreign Direct Investment: Empirical Evidence on Effects and Alternative Policy Options, *Canadian Tax Journal* 48, 1139-1180.
- Clemons, R. and M. Kinney (2008): An Analysis of the Tax Holiday for Repatriation Under the Jobs Act, *Tax Notes*, 120, 759-768.
- Cooper, M. and C. Boynton (2004): *The impact of changing the corporate net operating loss carryback period*, Proceedings of the ninety-sixth annual conference on taxation, National Tax Association, Washington D.C.
- Cooper, M. and M. Knittel (2006): Partial Loss Refundability: How are Corporate Tax Losses Used?, *National Tax Journal* 59, 651-663.
- Cooper, M. and M. Knittel (2010): The Implications of Tax Asymmetry for U.S. Corporations, *National Tax Journal* 63, 33-62.
- Creedy, J. and N. Gemmell (2008): *Behavioural responses to corporate profit taxation*, The University of Melbourne and The Treasury Research Paper No. 1029, New Zealand.
- Cummins, J. G., K. A. Hassett, and R. G. Hubbard (1995): Have Tax Reforms Affected Investment? In Poterba, James M. (ed.): *Tax Policy and the Economy*, Volume 9. MIT Press, Cambridge MA.
- Davies, R.B. (2003): Tax Treaties, Renegotiations, and Foreign Direct Investment, *Economic Analysis and Policy* 33, 251-273.
- Davies, R.B. (2004): Tax Treaties and Foreign Direct Investment: Potential versus Performance, *International Tax and Public Finance* 11, 775–802.

- Davies, R.B., P.J. Norbaeck and A. Tekin-Koru (2009): The Effect of Tax Treaties on Multinational Firms: New Evidence from Microdata, *The World Economy*, 77-110.
- De Jong, A., R. Kabir, and T.T. Nguyen (2008): Capital Structure Around the World: The Roles of Firm- and Country-Specific Determinants, *Journal of Banking and Finance* 32, 1954-1969.
- De Mooij, R.A. and S. Ederveen (2003): Taxation and Foreign Direct Investment: a Synthesis of Empirical Research, *International Tax and Public Finance* 10, 673-693.
- Desai, M.A., C.F. Foley and J.R. Hines (2004a): A Multinational Perspective on Capital Structure Choice and Internal Capital Markets, *Journal of Finance*, 59, 2451-2487.
- Desai, M.A., C.F. Foley and J.R. Hines (2007): Dividend Policy Inside the Multinational Firm, *Financial Management* 36, 5-26.
- Desai, M.A., C.F. Foley and J.R. Hines (2008): Capital Structure with Risky Foreign Investment, *Journal of Financial Economics* 88, 534-553.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2002): Chains of ownership, regional tax competition and foreign direct investment, NBER working paper, Cambridge MA.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2004b): Foreign direct investment in a world of multiple taxes, *Journal of Public Economics* 88, 2727– 2744.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2006a): Do Tax Havens Divert Economic Activity?, *Economics Letters* 90, 219-224.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2006b): The Demand for Tax Haven Operations, *Journal of Public Economics* 90, 513-531.
- Desai, M.A., C.F. Foley and J.R. Hines Jr. (2006c): Dividend Policy Inside the Multinational Firm, *Financial Management* 36, 5-26.
- Devereux, M.P. (1989): Tax Asymmetries, the Cost of Capital and Investment: Some Evidence from United Kingdom Panel Data, *Economic Journal* 99, 103-112.
- Devereux, M.P. and C. Fuest (2009): Is the Corporate Tax an Effective Automatic Stabilizer?, *National Tax Journal* 62, 429-437.
- Devereux, M.P. and R. Griffith (2003): Evaluating Tax Policy for Location Decisions, *International Tax and Public Finance* 10, 107 - 126.
- Devereux, M.P. and S. Loretz (2008): Increased efficiency through consolidation and formula apportionment in the European Union?, Working Paper.
- Devereux, M.P., M. Keen and F. Schiantarelli (1994): Corporation Tax Asymmetries and Investment, *Journal of Public Economics* 53, 395-418.
- Dharmapala, D. and J.R. Hines Jr. (2009): Which Countries Become Tax Havens?, *Journal of Public Economics* 93, 1058-1068.
- Dharmapala, D., F. Foley and K.J. Forbes (2011): Watch What I Do, Not What I Say: The Unintended Consequences of the Homeland Investment Act, *Journal of Finance*, 66, 753-787.
- Di Giovanni, J. (2005): What Drives Capital Flows? The Case of Cross-Border M&A Activity and Financial Deepening, *Journal of International Economics* 65, 127-149.
- Dickescheid, T. (2004): Exemption vs. Credit Method in International Double Taxation Treaties, *International Tax and Public Finance* 11, 721-739.

- Dischinger, M., U. Glogowski, and M. Strobel (2010): *Leverage, Corporate Taxes and Debt Shifting of Multinationals: The Impact of Firm-Specific Risk*, Working Paper, University of Munich.
- Domar, E.D. and R.A. Musgrave (1944): Proportional Income Taxation and Risk-Taking, *Quarterly Journal of Economics* 58, 388-422.
- Donnelly, M. and A. Young (2002): Policy Options for Tax Loss Treatment: How does Canada Compare?, *Canadian Tax Journal* 50, 429–488.
- Dörfler, H. and A. Vogl (2007): Unternehmensteuerreform 2008: Auswirkungen der geplanten Zinsschranke anhand ausgewählter Beispiele, *Betriebs Berater* 62, 1084 - 1087.
- Dourado, A.P. and R. de la Feria (2008): *Thin capitalization rules in the context of the CCCTB*, Oxford University Centre for Business Taxation Working Paper 08/04.
- Dreßler, D. and M. Overesch (2010): *Investment Impact of Tax Loss Treatment – Empirical Insights from a Panel of Multinationals*, ZEW Discussion Paper 10-097.
- Dreßler, D. and M. Overesch (2012): Investment Impact of Tax Loss Treatment, *International Tax and Public Finance*, online since June 19, 2012, print version forthcoming.
- Dwenger, N. (2008): *Tax Loss Offset Restrictions - Last Resort for the Treasury? An Empirical Evaluation of Tax Loss Offset Restrictions Based on Micro Data*. DIW Discussion Paper 764, Berlin.
- Dwenger, N. and F. Walch (2011): *Tax Losses and Firm Investment: Evidence from Tax Statistics*, Discussion paper in the preliminary version of December 12, 2011.
- Dwenger, N. and V. Steiner (2009): *Financial Leverage and Corporate Taxation. Evidence from German Corporate Tax Return Data*, Working Paper, German Institute for Economic Research.
- Dwenger, N. and V. Steiner (2012): Profit Taxation and the Elasticity of the Corporate Income Tax Base: Evidence from German Corporate Tax Return Data, *National Tax Journal* 65, 117-150.
- Edgerton, J. (2010): Investment Incentives and Corporate Tax Asymmetries, *Journal of Public Economics* 94, 936-952.
- Edmiston, K., S. Mudd and N. Valev (2003): *Tax Structures and FDI - The Deterrent Effects of Complexity and Uncertainty*, William Davidson Working Paper 558.
- Eeckhoudt, L., C. Gollier and H. Schlesinger (1997): The No-Loss Offset Provision and the Attitude Towards Risk of a Risk-Neutral Firm, *Journal of Public Economics* 65, 207-217.
- Egger, P. and V. Merlo (2011): Statutory Corporate Tax Rates and Double-Taxation Treaties as Determinants of Multinational Firm Activity, *FinanzArchiv* 67, 145-170.
- Egger, P. and W. Eggert (2010): Corporate Taxation, Debt Financing and Foreign Plant Ownership, *European Economic Review*, 96-107.
- Egger, P., M. Larch, M. Pfaffermayr and H. Winner (2006): The Impact of Endogenous Tax Treaties on Foreign Direct Investment: Theory and Empirical Evidence, *Canadian Journal of Economics* 39, 901-931.
- Egger, P., M. Larch, M. Pfaffermayr and H. Winner (2009): Bilateral Effective Tax Rates and Foreign Direct Investment, *International Tax and Public Finance* 16, 822–849.

- Egger, P., S. Loretz, M. Pfaffermayr and H. Winner (2004): *Corporate Taxation and Multinational Activity*, Oxford University Centre for Business Taxation, Working Paper no. 09/04.
- Egger, P., S. Loretz, M. Pfaffermayr and H. Winner (2009): *Corporate Taxation and Multinational Activity*, Oxford University Centre for Business Taxation Working Paper 09/04.
- Egger, P., V. Merlo, M. Ruf and G. Wamser (2012): *Consequences of the new UK tax exemption system: evidence from micro-level data*, working paper June 11, 2012.
- Eilers, S. (2007): Fremdfinanzierung im Unternehmen nach der Unternehmenseurereform 2008, *Finanzrundschau* 89, 733 - 735.
- Elschner, C., J.H. Heckemeyer and C. Spengel (2011): Besteuerungsprinzipien und effektive Unternehmenssteuerbelastungen in der Europäischen Union: Regelt sich die EU-weite Steuerharmonisierung von selbst?, *Perspektiven der Wirtschaftspolitik* 12, 47–71.
- Endres, D. (2007): Auswirkungen der Zinsschranke auf die Gesellschafter-Fremdfinanzierung, *Praxis Internationale Steuerberatung*, 230 - 235.
- European Commission (2011): *Proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB)*, COM(2011) 121/4, Brussels.
- Faccio, M., and L. H. P. Lang (2002): The Ultimate Ownership of Western European Corporations, *Journal of Financial Economics* 65, 365–95.
- Feld, L. und J.H. Heckemeyer (2011): FDI and Taxation – A Meta Study, *Journal of Economic Surveys* 25, 233-272.
- Feld, L., J. Heckemeyer and M. Overesch (2011): *Capital Structure Choice and Company Taxation: A Meta-Study*, CESifo Working Paper No. 3400, Munich.
- Feld, L.P. and J. Heckemeyer (2011): FDI and Taxation: a Meta Study, *Journal of Economic Surveys* 25, 233-272.
- Fochmann, M., D. Kiesewetter and A. Sadrieh (2012): Investment Behavior and the Biased Perception of Limited Loss Deduction in Income Taxation, *Journal of Economic Behavior & Organization* 81, 230-242.
- Foley, C., J. Hartzell, S. Titman and G. Twite (2007): Why do Firms Hold so Much Cash? A Tax-Based Explanation, *Journal of Financial Economics*, 86, 579-607.
- Führich, G. (2007): Ist die geplante Zinsschranke europarechtskonform? *Internationales Steuerrecht*, 341 - 345.
- Galindo, A.J. and C. Pombo (2011): Corporate taxation, investment and productivity - A firm level estimation, *Journal of Accounting and Taxation* 5, 158-161.
- Ganssauge, K. and O. Mattern (2008): Der Eigenkapitaltest im Rahmen der Zinsschranke, *Deutsches Steuerrecht*, 213 - 219 and 267 - 270.
- Gendron, P., G. Anderson and J. Mintz (2003): *Corporation Tax Asymmetries and Firm-Level Investment in Canada*, ITP Paper 0303. International Tax Program, Rotman School of Management, Toronto.
- Gentry, W. (1994): Taxes, Financial Decisions and Organizational Form: Evidence from Publicly Traded Partnerships, *Journal of Public Economics* 53, 223-244.
- Gomes-Casseres, B. (1989): Ownership Structures of Foreign Subsidiaries, *Journal of Economic Behavior and Organization* 11, 1-25.

- Gordon, R. and Y. Lee (2001): Do Taxes Affect Corporate Debt Policy? Evidence from U.S. Corporate Tax Return Data, *Journal of Public Economics* 82, 195 - 224.
- Gordon, R. and Y. Lee (2007): Interest Rates, Taxes and Corporate Financial Policies, *National Tax Journal* 60, 65 - 84.
- Gordon, R.H. and J.K. MacKie-Mason (1997): How Much Do Taxes Discourage Incorporation, *Journal of Finance* 52, 477-505.
- Graham, J.R. (1996): Debt and the Marginal Tax Rate, *Journal of Financial Economics* 41, 41-73.
- Graham, J.R. (1999): Do Personal Taxes Affect Corporate Financing Decisions?, *Journal of Public Economics* 73, 147 - 185.
- Graham, J.R. (2003): Taxes and Corporate Finance: A Review, *Review of Financial Studies* 16, 1075 - 1129.
- Graham, J.R. and H. Kim (2009): The Effects of the Length of the Tax-Loss Carryback Period on Tax Receipts and Corporate Marginal Tax Rates, *National Tax Journal* 62, 413-427.
- Graham, J.R., M.L. Lemmon and J.S. Schallheim (1998): Debt, Leases, Taxes, and the Endogeneity of Corporate Tax Status, *Journal of Finance* 53, 131-161.
- Green, C.J., and V. Murinde (2008): The Impact of Tax Policy on Corporate Debt in a Developing Economy: A Study of Unquoted Indian Companies, *European Journal of Finance* 14, 583- 607.
- Grotherr, S. (2008): Funktionsweise und Zweifelsfragen der neuen Zinsschranke, *Internationale Wirtschafts-Briefe* 07, 1489 - 1508.
- Grubert, H and Altshule, R (2000): *Repatriation Taxes, Repatriation Strategies and Multinational Financial Policy*, NBER Working Paper No. 8144.
- Grubert, H and Altshuler, R (2006): *Corporate Taxes in the World Economy: Reforming the Taxation of Cross-border Income*, Rutgers NJ State University working paper.
- Grubert, H. and J. Slemrod (1998): The Effect of Taxes on Investment and Income Shifting to Puerto Rico, *Review of Economics and Statistics* 80, 365-373.
- Harberger, A. (1962): The Incidence of the Corporation Income Tax, *Journal of Political Economy* 70, 215-240.
- Hartman, D. (1985): Tax Policy and Foreign Direct Investment, *Journal of Public Economics* 26, 107-121.
- Haufler, A. and M. Runkel (2008): *Firms' Financial Choices and Thin Capitalization Rules under Corporate Tax Competition*, CESifo Working Paper No. 2429, Munich.
- Heckemeyer, J.H. and C. Spengel (2008): Ausmaß der Gewinnverlagerung multinationaler Unternehmen empirische Evidenz und Implikationen für die deutsche Steuerpolitik, *Perspektiven der Wirtschaftspolitik* 9, 37-61.
- Herzig, N. (2005): *Verluste im Körperschaftsteuerrecht*, in: Verluste im Steuerrecht, Groll, Rüdiger von (ed.), Deutsche Steuerjuristische Gesellschaft e. V., Volume 28, Cologne 2005, 185-203.
- Herzig, N. and A. Bohn (2007): Modifizierte Zinsschranke und Unternehmensfinanzierung, *Der Betrieb* 60, 1 - 10.

- Herzig, N. and B. Liekenbrock (2010): Zum EBITDA-Vortrag der Zinsschranke, *Der Betrieb*, 690 - 695.
- Herzig, N., U. Lochmann and B. Liekenbrock (2008): Die Zinsschranke im Lichte einer Unternehmensbefragung. Einfluss auf Steuerplanung, Steuergestaltung und Steuerbelastung, *Der Betrieb* 61, 593 - 602.
- Hey, J. (2007): Verletzung fundamentaler Besteuerungsprinzipien durch die Gegenfinanzierungsmassnahmen des Unternehmenssteuerreformgesetzes 2008, *Betriebs-Berater* 62, 1303 - 1309.
- Hines, J.R. (1994): Credit and Deferral as International Investment Incentive, *Journal of Public Economics* 55, 323-347.
- Hines, J.R. (1996): Altered States: Taxes and the Location of Foreign Direct Investment in America, *The American Economic Review* 86, 1076-1094.
- Hines, J.R. Jr. (1994): Credit and Deferral as International Investment Incentives, *Journal of Public Economics* 55, 323-347.
- Hines, J.R. Jr. and E.M. Rice (1994): Fiscal Paradise: Foreign Tax Havens and American Business, *Quarterly Journal of Economics* 109, 149–182.
- Homburg, S. (2007): Die Zinsschranke - eine beispiellose Steuerinnovation, *Finanzrundschau* 89, 717 - 728.
- Homburg, S., H. Houben and R. Maiterth (2007): Rechtsform und Finanzierung nach der Unternehmensteuerreform 2008, *Die Wirtschaftsprüfung* 60, 376 - 381.
- Hornig, M. (2007): Die Zinsschranke - ein europarechtlicher Irrweg, *Praxis Internationale Steuerberatung*, 215 - 220.
- Hoshi, T., A. Kashyap, and D. Scharfstein (1991): Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups, *Quarterly Journal of Economics* 106, 33–60.
- Huang, R., and J.R. Ritter (2009): Testing Theories of Capital Structure and Estimating the Speed of Adjustment, *Journal of Financial and Quantitative Analysis* 44, 237-271.
- Hubert, F. and N. Pain (2002): *Fiscal Incentives, European Integration and the Location of Foreign Direct Investment*, National Institute of Economic and Social Research Working Paper.
- Huizinga, H. and J. Voget (2009): International Taxation and the Direction and Volume of Cross-Border M&As, *Journal of Finance* 64, 1217-1249.
- Huizinga, H. and L. Laeven (2008): International Profit Shifting within Multinationals: A Multi-Country Perspective, *Journal of Public Economics* 92, 1164-1182.
- Huizinga, H., L. Laeven and G. Nicodème (2007): *Capital Structure and International Debt Shifting*, CEB Working Paper No 07/015.
- Huizinga, H., L. Laeven and G. Nicodème (2008): Capital Structure and International Debt Shifting, *Journal of Financial Economics* 88, 80 - 118.
- Jacob, M., A. Pasedag and F.W. Wagner (2011): Werden niedrige Steuersätze in Osteuropa durch Verzicht auf Verlustverrechnung erkauf?, *Perspektiven der Wirtschaftspolitik* 12, 72–91.
- Janeba, E. (1995): Corporate Income Tax Competition, Double Taxation Treaties, and Foreign Direct Investment, *Journal of Public Economics* 56, 311-325.

- Jugurnath B., M. Stewart and R. Brooks (2008): Dividend Taxation and Corporate Investment: a Comparative Study between the Classical System and Imputation System of Dividend Taxation in the United States and Australia, *Review of Quantitative Finance and Accounting* 31, 209-224.
- Kesternich, I., and M. Schnitzer (2010): Who is Afraid of Political Risk? Multinational Firms and their Choice of Capital Structure, *Journal of International Economics* 82, 208-218.
- Keuschnigg, C. (2008): Exports, Foreign Direct Investment, and the Costs of Corporate Taxation, *International Tax and Public Finance* 15, 460-477.
- King, M.A. (1974a): Taxation and the Cost of Capital, *Review of Economic Studies* 41, 21-35.
- King, M.A. (1974b): Dividend Behaviour and the Theory of the Firm, *Economica* 41, 25-34.
- Klapper, L.F. and K. Tzioumis (2012): Taxation and Capital Structure: Evidence from a Transition Economy, *FinanzArchiv*, 165-190.
- Köhler, S. (2007): Erste Gedanken zur Zinsschranke nach der Unternehmensteuerreform, in: *Deutsches Steuerrecht* 45, 597 - 604.
- La Porta, R., F. Lopez-de-Silanes, and A. Shleifer (1999): Corporate Ownership around the World, *Journal of Finance* 54, 471–517.
- Lemmon, M.L., M.R. Roberts and J.F. Zender (2008): Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure, *Journal of Finance* 63, 1575 - 1608.
- Lenz, M., O. Doerfler and G. Adrian (2010): Änderungen bei der Zinsschranke durch das Wachstumsbeschleunigungsgesetz, *Die Unternehmensbesteuerung*, 1 - 7.
- Lipponer, A. (2008): *Microdatabase direct investment – a brief guide*, Frankfurt.
- Louie, H.J. and D.J. Rousslang (2008): Host-country Governance, Tax Treaties and US Direct Investment Abroad, *International Tax and Public Finance* 15, 256-273.
- MacKie-Mason, J.K. (1990): Do Taxes Affect Corporate Financing Decisions?, *Journal of Finance* 45, 1471 - 1493.
- MacKie-Mason, J.K. (1990): Some Nonlinear Tax Effects on Asset Values and Investment Decisions under Uncertainty, *Journal of Public Economics* 42, 301-327.
- Majd, S. and S.C. Myers (1987): *Tax Asymmetries and Corporate Tax Reform*, in: M. Feldstein (Ed.), *The Effects of Taxation on Capital Accumulation*, Chicago, 343-376.
- Masulis, R.W., P. K. Pham and J. Zein (2011): Family Business Groups around the World: Financing Advantages, Control Motivations and Organizational Choices, Masulis and P. Kien Pham, *Review of Financial Studies* 24, 3556-3600.
- Miller, M. (1977): Debt and Taxes, *Journal of Finance* 32, 261-275.
- Millimet, D. and A. Kumas (2007): *Reassessing the effects of bilateral tax treaties on US FDI activity*, Working Paper, Dallas.
- Mills, L.F. and K.J. Newberry (2004): Do Foreign Multinationals' Tax Incentives Influence their U.S. Income Reporting and Debt Policy? *National Tax Journal* 57, 89-107.
- Mintz, J. (1988): An Empirical Estimate of Corporate Tax Refundability and Effective Tax Rates, *Quarterly Journal of Economics* 103 (1), 225–231.
- Mintz, J. (2004): Conduit Entities: Implications of Indirect Tax-efficient Financing Structures for Real Investment, *International Tax and Public Finance* 11, 419-434.

- Mintz, J. and A. Weichenrieder (2010): *The Indirect Side of Direct Investment – Multinational Company Finance and Taxation*, Cambridge, MA.
- Mintz, J. and A. Weichenrieder (2010a): *What Determines the Use of Holding Companies and Ownership Chains*, Oxford University Centre for Business Taxation Working Paper.
- Mintz, J. and H. Tulkens (1996): Optimality Properties of Alternative Systems of Taxation of Foreign Capital Income, *Journal of Public Economics* 60, 373-401.
- Mintz, J.M. (1981): Some Additional Results on Investment, Risk Taking, and Full Loss Offset Corporate Taxation with Interest Deductibility, *Quarterly Journal of Economics* 96, 631-642.
- Mintz, J.M. (2004): Conduit entities: Implications of Indirect Tax-efficient Financing Structures for Real Investment, *International Tax and Public Finance* 11, 419-434.
- Modigliani, F. and M. Miller (1958): The Cost of Capital, Corporation Finance, and the Theory of Investment, *American Economic Review* 48, 261 - 297.
- Modigliani, F. and M. Miller (1963): Corporate Income Taxes and the Cost of Capital: a Correction, *American Economic Review* 53, 433 - 443.
- Morck, R. (2003): *Why some Double Taxation might make Sense: the Special Case of Inter-Corporate Dividends*, NBER working paper.
- Mossin, J. (1968): Taxation and risk-taking: an expected utility approach, *Economica* 35, 74-82.
- Moulton, B.R. (1990): An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units, *Review of Economics and Statistics* 72, 334-338.
- Müller-Gatermann, G. (2004): Aktuelles zum Unternehmenssteuerrecht, *Die Wirtschaftsprüfung* 2004, 467-476.
- Musil, A. and B. Volmering (2008): Systematische, verfassungsrechtliche und europarechtliche Probleme der Zinsschranke, *Der Betrieb* 1, 12 - 16.
- Mutti, J. and H. Grubert (2004): Empirical Asymmetries in Foreign Direct Investment and Taxation, *Journal of International Economics* 62, 337-358.
- Myers, S. C. (1977): Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147 - 175.
- Myers, S. C. (1984): The Capital Structure Puzzle, *Journal of Finance* 39, 575 - 592.
- Neumayer, E. (2007): Do Double Taxation Treaties Increase Foreign Direct Investment to Developing Countries?, *Journal of Development Studies* 43, 1501 — 1519.
- Neumayer, E. and L. Spess (2005): Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries?, *World Development* 33, 1567-1585.
- Newberry, K.S. and D.S. Dhaliwal (2001): Cross-Jurisdictional Income Shifting by U.S. Multinationals: Evidence from International Bond Offerings, *Journal of Accounting Research* 39, 643-662.
- Nickell, S.J. (1981): Biases in Dynamic Models with Fixed Effects, *Econometrica* 49, 1417-1426.
- Niemann, R. (2004): Investitionswirkungen steuerlicher Verlustvorträge – Wie schädlich ist die Mindestbesteuerung?, *Zeitschrift für Betriebswirtschaft* 2004, 359-384.
- Niemann, R. (2008): The Effects of Differential Taxation on Managerial Effort and Risk Taking, *Finanzarchiv* 64, 273–310.

- OECD (2008): Tax Effects on Foreign Direct Investment - Recent Evidence and Policy Analysis, OECD Tax Policy Study.
- Organization for Economic Cooperation and Development (OECD) (2010): *Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations*, Paris.
- Overesch, M. and D. Voeller (2010): The Impact of Personal and Corporate Taxation on Capital Structure Choices, *Public Finance Analysis* 66, 263 - 294.
- Overesch, M. and G. Wamser (2009): Who Cares About Corporate Taxation? Asymmetric Tax Effects on Outbound FDI, *World Economy* 32, 1657-1684.
- Overesch, M., and D. Voeller (2010): The Impact of Personal and Corporate Taxation on Capital Structure Choices, *FinanzArchiv* 66, 263-294.
- Overesch, M., and G. Wamser (2010): Corporate Tax Planning and Thin-Capitalization Rules: Evidence from a Quasi Experiment, *Applied Economics* 42, 563-573.
- Pasedag, A. (2010): Paradoxe Wirkungen der Zinsschranke, *Corporate Finance biz* 12/5, 301 - 311.
- Pfaffermayr, M., M. Stoeckl, and H. Winner (2009): *Capital Structure, Corporate Taxation and Firm Age*, Working Paper, Salzburg University.
- Piltz, D.J. (1996): *International Aspects of Thin Capitalization*, IFA general report vol. LXXXIb, Rotterdam 1996, 19 - 81.
- Poterba, J. (2004): *Taxation and Corporate Payout Policy*, NBER Working Paper.
- Radulescu, D.M. and M. Stimmelmayer (2008): Die Unternehmensteuerreform 2008: Eine Reformalternative für Deutschland?, *Perspektiven der Wirtschaftspolitik* 9, 19-36.
- Rajan, R.G. and L. Zingales (1995): What do we know about Capital Structure? Some Evidence from International Data, *Journal of Finance* 50, 1421 - 1460.
- Redmiles, M. (2008): The One-Time Received Dividend Deduction, *Statistics of Income Bulletin*, 102-114.
- Rödter, T. and I. Stangl (2007): Zur geplanten Zinsschranke, *Der Betrieb*, 479 - 485.
- Rödding, A. (2009): Änderungen der Zinsschranke durch das Wachstumsbeschleunigungsgesetz, *Deutsches Steuerrecht*, 2649 - 2651.
- Ruf, M. (2010): Trade Off or Pecking Order - What Drives the Leverage of Subsidiaries in High Tax Countries up?, Working Paper, University of Mannheim.
- Ruf, M. and A.J. Weichenrieder (2011): The Taxation of Passive Foreign Investment: Lessons from German Experience, *Canadian Journal of Economics*, Forthcoming.
- Ruf, Martin (2011): Why is the Response of Multinationals' Capital Structure Choice to Tax Incentives That Low? Some Possible Explanations, *FinanzArchiv* 67/2, 123-144.
- Salacuse, J.W. and N.P. Sullivan (2005): Do BITs really work: an evaluation of bilateral investment treaties and their grand bargain, *Harvard International Law Journal* 46, 67-130.
- Schwarz, (2008): Zur Notwendigkeit einer Zinsschranke: Empirische Befunde und Probleme, *Internationales Steuerrecht* 1, 11 - 14.
- Sinn, H.W. (1984): Die Bedeutung des Accelerated Cost Recovery System fuer den internationalen Kapitalverkehr, *Kyklos* 37, 542-576.

- Sinn, H.W. (1993): *Taxation and the Birth of Foreign Subsidiaries*, in: H. Heberg and N. Van Long (Eds), *Trade, Welfare, and Economic Policies - Essays in Honor of Murray C. Kemp*, University of Michigan Press, 325-352.
- Smart, M. (2011): *Repatriation taxes and foreign direct investment: Evidence from tax treaties*, University of Toronto working paper.
- Sullivan L.H. (1896): The Tall Office Building Artistically Considered, *Lippincott's Magazine* 57, 403-09, republished in 1905 as: Form and Function Artistically Considered, *The Craftsman* 8, 453-58.
- Sullivan L.H. (1906): What is Architecture? A Study in the American People of Today, published in: *The Public Papers* (1988), 174-195.
- Swenson, D.L. (1994): The Impact of U.S. Tax Reform on Foreign Direct Investment in the United States, *Journal of Public Economics* 54, 243-266.
- Taub, A.J. (1975): Determinants of firm's capital structure, *Review of Economics and Statistics* 57, 410 - 416.
- Thiel, J. (2007): Die Steuerliche Behandlung von Fremdfinanzierungen im Unternehmen, *Finanzrundschau* 89, 729 - 733.
- Thoemmes, O., R. Stricof and K. Nakhai (2004): Thin Capitalization Rules and Non-Discrimination Principles, *International Tax Review*, 126 - 137.
- Töben, T. (2007): Die Zinsschranke - Befund und Kritik, *Finanzrundschau* 89, 739 - 746.
- Trezevant, R (1992): Debt Financing and Tax Status: Tests of the Substitution Effect and the Tax Exhaustion Hypothesis Using Firms' Response to the Economic Recovery Act of 1981, *Journal of Finance* 47, 1557-1568.
- Wamser, G. (2008a): *Foreign (in)direct investment and corporate taxation*, German Federal Bank Discussion Paper 15/2008.
- Wamser, G. (2008b): *The Impact of Thin capitalization Rules on External Debt Usage - A Propensity Score Matching Approach*, ifo Working Paper No. 62.
- Wamser, G. (2011): Foreign (in)direct investment and corporate taxation, *Canadian Journal of Economics* 44, 1497-1524.
- Weichenrieder, A. (1996): Anti-Tax Avoidance Provisions and the Size of Foreign Direct Investment, *International Tax and Public Finance* 3, 67-81.
- Weichenrieder, A. and H. Windischbauer (2008): *Thin Capitalization Rules and Company Responses*, CESifo Working Paper No. 2456, Munich.
- Welling, B. (2007): Die Zinsschranke. Übersteigerte politische Zielvorgabe an eine Neuordnung der Regelungen zur Gesellschafter Fremdfinanzierung, *Finanzrundschau* 89, 735 - 739.
- Winkeljohann, N. and S. Fuhrmann (2007): *Grundprinzipien der Zinsschranke*, in: Die Unternehmenssteuerreform 2008, PwC, Stuttgart, 76 - 120.
- Winkelmann, R. (2008): *Econometric analysis of count data*, Berlin and Heidelberg.
- Winkelmann, R. (2009): *Analysis of microdata*, Berlin and Heidelberg.
- Wooldridge, J. M. (2008): *Introductory Econometrics*, fourth edition, Scarborough 2009.
- Wooldridge, J.M. (2002): *Econometric analysis of cross section and panel data*, Cambridge, Massachusetts, The MIT Press.

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Wissenschaftlicher Mitarbeiter im Forschungsbereich
Unternehmensbesteuerung und Öffentliche Finanzwirtschaft

März 2009 – Dez. 2012 Universität Mannheim
Doktorand am Lehrstuhl für Allgemeine Betriebswirtschaftslehre
und Betriebswirtschaftliche Steuerlehre, Prof. Dr. Ulrich Schreiber

Ausbildung

Okt. – Nov. 2012 University of California at Berkeley
Forschungsaufenthalt bei Professor Dr. Alan Auerbach

März 2012 Steuerberater: Bestandene Prüfung und Bestellung

Mai 2010 Certified Public Accountant (CPA): Bestandene Prüfung in
Kalifornien mit anschließender Registrierung in Illinois

Okt. 2004 – Feb. 2009 Universität Mannheim
Betriebswirtschaftslehre mit interkultureller Qualifikation
Abschluss als Diplom-Kaufmann mit der Note „sehr gut“
Spezialisierungen: Wirtschaftsprüfung, Steuern, Steuerrecht

Aug. 2006 – Juni 2007 Corvinus Universität Budapest
2 Semester integriertes Auslandsstudium der BWL

Juli 2002 – Juni 2003 Bundeswehr
Wehrdienst als Sanitäter und Trompeter (Heeresmusikkorps 12)

Mai 2002 Franken-Landschulheim Schloss Gaibach
Bayerisches Abitur mit Durchschnittsnote 1,0

Frühere Berufserfahrung

Jan. 2003 – Feb. 2008 Praktika bei den Unternehmen
BMW AG, Ernst & Young AG, KPMG Hungária Kft,
McKinsey & Co, KPMG AG